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ABSTRACT

The purpose of this book is to assist physical education teachers in the development and implementation of a safe and well-balanced program of activities and to provide students with information about safe participation in common sports. Using a checklist format, information is presented to facilitate the development of unit and lesson plans. The volume is organized into the following 25 chapters: (1) "The Injury Problem" (David A. Feigley and Murray F. Mitchell); (2) "Legal Responsibility for Safety in Physical Education and Sport" (Neil J. Dougherty IV); (3) "Administration of Safety in Physical Education and Sports" (Patricia E. Barry); (4) "First Aid and Sport Safety Policies" (Phil Hossler); (5) "Aerobic Fitness Programs" (Russell R. Pate and Linda Szymanski); (6) "Aquatics" (Ralph L. Johnson); (7) "Archery" (Claire Chamberlain); (8) "Basketball" (James E. Bryant); (9) "Dance" (Lynne Fitzgerald); (10) "Exercise Programs" (Clair W. Jennett); (11) "Field Hockey" (Barbara Belt); (12) "Flag Football" (Maryann Domitrovitz); (13) "Floor Hockey" (Gary R. Gray); (14) "Games" (Neil J. Dougherty IV); (15) "Golf" (Dede Owens and James Ewers); (16) "Gymnastics" (Kathleen Feigley and Diane Bonanno); (17) "Orienteering" (Arthur Hugglestone and Bernie Samm); (18) "Playground Activities" (Susan J. Antle); (19) "Racquet Sports" (John Smyth); (20) "Self-defense" (Kenneth Tillman); (21) "Soccer" (John Fellenbaum); (22) "Softball" (Diane Bonanno and Sonia Regalado); (23) "Track and Field" (LeRoy T. Walker); (24) "Volleyball" (Barbara L. Viera); and (25) "Wrestling" (Douglas Parker). (LL)

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Principles of Safety

in Physical Education and Sport

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Principles of Safety

in Physical Education and Sport

Revised Edition

Neil J. Dougherty IV
Editor

A project of the
National Association for Sport and Physical Education
an association of the
American Alliance for Health, Physical Education, Recreation and Dance

The American Alliance for Health, Physical Education, Recreation and Dance is an educational organization designed to support, encourage, and provide assistance to member groups and their personnel nationwide as they initiate, develop, and conduct programs in health, leisure, and movement-related activities. The Alliance seeks to:

- Encourage, guide, and support professional growth and development in health, leisure, and movement-related programs based on individual needs, interests, and capabilities.
- Communicate the importance of health, leisure, and movement-related activities as they contribute to human well-being.
- Encourage and facilitate research which will enrich health, leisure, and movement-related activities and to disseminate the findings to professionals and the public.
- Develop and evaluate standards and guidelines for personnel and programs in health, leisure, and movement-related activities.
- Coordinate and administer a planned program of professional, public, and government relations that will improve education in areas of health, leisure, and movement-related activities.
- Conduct other activities for the public benefit.

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Preface

The ever present threat of litigation in connection with student injuries, the inescapable fact that the guidelines and recommendations of the National Association for Sport and Physical Education (NASPE) are frequently considered in assessing potential liability, and most importantly, the desire to promote the safest programs possible precipitated the development of *Principles of Safety in Physical Education and Sport* in 1987.

The same quality of authorship and validity of content that led to the broad acceptance of the first edition have been followed in this second edition. The text is designed to provide the professional with a straightforward and complete resource of those factors that must be considered in the provision of safe units of instruction in the commonly taught sports and activities of the physical education program. Using a format that relies heavily on checklists, the authors have provided the essential information in a manner that facilitates its use in the development of detailed unit and lesson plans as well as for quick preclass safety checks.

It is the intention of the National Association for Sport and Physical Education that this book will assist the teacher in the development and implementation of a safe and well-balanced program of activities. It should help the teacher provide students with information about safe participation in common sports and activities from which they can benefit throughout their lifetime.

Principles of Safety in Physical Education and Sport can serve as a companion resource to another text prepared under the sponsorship of NASPE, *Physical Activity and Sport for the Secondary School Student*. The 1993 edition of this comprehensive and authoritative textbook provides teachers and students with information on skill and technique acquisition, safety, scoring, rules and etiquette, strategies, equipment, and related terminology for a variety of sports and activities included in present-day program offerings.

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The Injury Problem

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Disease is a high profile killer. There are telethons and foundations that raise funds to support the important and specialized work of trying to find cures for a whole host of diseases which, in a variety of terrible forms, are a major cause of death in the United States. It is injury, however, that stands as the single greatest killer of children ages 1–14 in this country. Injuries account for 51% of the deaths in this age group; the next closest single cause of death is cancer, accounting for only 12% of deaths (National Center for Health Statistics, 1988). While not all injuries lead to death, on any given day more than 170,000 injuries occur which are serious enough to require medical care (National Center for Health Statistics, 1987).

Scope of the Problem

Statistics on the full impact of injuries are difficult to gather since agencies that collect data on the topic have a variety of definitions for the term. This variance is partially a result of the fact that agencies have different purposes for such data collection (e.g., knowing what injuries require treatment vs. determining the cause of such injuries) and because agencies differ in their organizational responsibility to the participating individuals (e.g., national survey systems vs. a local coaching staff). Hence, comparisons of injury or fatality rates for the general population versus the rates for athletes are difficult to make because of the lack of information and because the data that are available have been collected using different criteria.

Nonetheless, according to experts in epidemiology and public health, nearly two-thirds of all illnesses and injuries could be prevented. Nowhere is this fact more relevant than with sports injuries. While many assume that most sports injuries are the result of "accidents," these accidents are frequently the result of factors which lead predictably to injuries. For example, different sports have different frequencies of injury. Estimated, sports-related injuries requiring medical attention for children in 1991 are presented by activity in Table 1. Often these accidents and injuries can be traced directly to social, environmental, and behavioral factors which, if regulated, would result in dramatic reductions in deaths and injuries. The fact that injuries are often considered "accidental" or as part of the inherent risk of sports is one of the major reasons why these social, environmental, and behavioral factors remain uncontrolled and, thus, why accidents and injuries continue to occur. If such accidents and injuries were perceived as predictable results of the lack of public health and accident control policies, actions would likely be taken to reduce "accidents" in terms of both frequency and severity.

Perceptions of injuries and their causes are shaped by operational definitions. Definitions serve two functions: first, they provide a specific focus as to what is to be studied; second, they provide peripheral boundaries concerning what to include and what to exclude from the topic to be analyzed. Paradoxically, definitions can be both enlightening and obstructing at the same time. While it is necessary to limit the field of possibilities when attempting to study a phenomenon, overly restrictive definitions can limit potential insights. Attributing the cause of injuries to "accidents," for example, contributes to perceptions of helplessness and unpredictability in the search for injury prevention strategies. And, as noted earlier, when different groups (with different motives) collect data on injuries while using different definitions, trends and patterns of injuries may be hidden from policy makers. With caveats stated, an attempt will be make to address the definition of injuries.

Defining an Injury

Haddon (1980) defined injury as "damage or trauma to the body caused by exchanges with environmental energy that are beyond the body's resilience" (p. 1). Two practical considerations are often part of injury definitions. First, an injury is deemed to have occurred if the victim loses time from an activity such as work, school, or play. For example, the National Athletic Injury/Illness Reporting System (NAIRS) defines a reportable injury as "any injury/illness which causes the cessation of an athlete's customary participation throughout the *participation-day following day of onset*." Thus, time lost from practice is often used as the threshold to determine whether damage sustained by an athlete is considered severe enough to be classified as an injury. The

Table 1
Estimates for Sports-Related Injuries Requiring Medical Attention in 1991

Activity	*Injuries Requiring Medical Attention*
Playgrounds	262,378
Football (organized)	149,527
Baseball (organized)	137,753
Basketball (organized)	120,503
Weight lifting	61,140
Track and field	58,586
Soccer (organized)	48,148
Wrestling	43,894
Dance	39,257
Golf	38,626
Swimming	34,748
Field hockey	31,145
Tennis	29,936
Volleyball (organized)	25,629
Exercise equipment	25,258
Ice hockey	23,456
Gymnastics (organized)	17,272
Cheerleading	11,682
Archery	7,397
Total	1,166,335

Source: Consumer Product Safety Commission (1992); National Injury Information Clearinghouse.

second practical consideration is the referral to a medical professional such as a trainer, nurse, physician, or emergency staffer. Bumps, bruises, and chronic stiffness which do not necessitate a visit for medical treatment are rarely counted in injury statistics. Only if their severity prompts a formal visit to a medical professional do they typically become classified as an injury.

Within the context of sports, distinctions are often made between injuries *directly* or *indirectly* attributable to participation in a sport. Damage sustained from mechanical energy tends to be more commonly associated with injuries resulting from accidents termed "directly attributable" to sport than to other forms of energies. For example, an accident caused by being hit by a ball or bat is likely to be seen as directly attributable to sport while heat stroke caused

by a lack of water while training in hot, humid conditions is more likely to be classified as an indirect sport injury.

Another common distinction made with regard to sport injuries is the classification as either acute or chronic. The American Academy of Orthopaedic Surgeons (1991) characterized acute injuries by a sudden onset or "sudden crisis, followed by a fairly predictable, though often lengthy, resolution to healing" (p. 104). Chronic injuries were characterized by "insidious onset, implying a gradual development of structural damage," which may result in a condition that "lasts months or even years and is characterized by persistence of the symptoms" (p. 104).

With distinctions made regarding different types of injuries, the next appropriate focus of attention is on the prevention of injuries. Once again, distinctions must be made between the related but different concerns of safety and risk.

Defining Safety

While the term "safety" is generally understood, its scientific meaning is often quite vague. According to Lowrance(1976), an activity is safe if its risks are deemed acceptable and acceptability is a matter of personal and societal value judgments. Thus, what is judged "safe" varies from time to time and from situation to situation.

Furthermore, Lowrance argues that what is typically measured scientifically is not safety but degree of risk. An activity is judged safe if the risks associated with that activity are judged acceptable. Stated differently, risk involves the calculation of the probability of harm—a scientific measurement. Safety involves the judgment of the acceptability of those risks—a value judgment. Thus, risks are something we measure while safety is something we must judge.

Defining Risk

Thygerson (1986) defines "risk" as "possible loss or the chance of a loss" (p. 39). Theoretically, measuring risks is quite straightforward. Taking into consideration the population data, the exposure data, and the injury data, the calculations for determining risk are quite simple. From a practical standpoint, measuring such risks is rarely carried out because gathering the appropriate data is often quite a substantial task. There are three general methods of measuring risk: (1) relative risk methods; (2) probability of occurrence methods; and (3) relative exposure rate methods.

1. **Relative risk methods.** An activity or hazard is rated according to a standard which can be ranked along a dimension of more or less. For

example, a boxing glove with nine ounces of padding is considered to be more risky than a glove with twelve ounces of padding. Sometimes a rating scale is adopted to reflect the approximate degree of risk. For example, in women's artistic gymnastics, athletes select skills rated from level "a" (easy) to level "d" (extremely risky).

2. **Probability of occurrence.** The likelihood of future injuries can be accurately estimated if records have been kept over reasonable periods of time for sizable populations which will continue the activity under similar conditions. Just as the National Safety Council can predict the number of fatalities for a given holiday period, the American Football Coaches Association Committee on Football Injuries can predict the number of football related fatalities for the upcoming season. Both groups have compiled a long history of fatality statistics which permit such prediction. If the future circumstances were changed from the situation upon which the original data were based, the estimates would differ more radically from the actual observed fatalities. For example, if the weather changed (e.g., it rained) or a rule change were implemented (e.g., spearing was eliminated in football), the actual number of deaths of injuries would change. The number of deaths directly attributable to participation in high school and collegiate football across a 30-year period are reported Table 2. While it is clear that fatalities were already on the decline, there was a decided additional drop in fatalities during the period after the 1976 rule change which eliminated spearing (i.e., making initial contact with the head).

Table 2
Direct Football Fatalities from Sandlot, Pro and Semipro, High School and College 1961-1990

5-Year Block	*Sandlot*	*Pro and Semipro*	*High School*	*College*
1961–65	18	3	75	12
1966-70	19	2	103	12
1971-75	8	1	61	7
1976–80	4	0	44	2
1981-86	7	0	24	4
1987-90	0	0	25	1

Source: National Federation News, May, 1991, p. 15.

3. **Relative exposure**. Risks may be portrayed in terms of exposure rates in order to compare different risks. For example, during the five-year period between 1959 and 1963, 820,000 youths played football and 86 deaths were reported. During the period from 1971 to 1975, 77 deaths were reported but the exposure rate rose substantially to 1,275,000 players (Torg, 1982). Thus, the actual risk appeared to have decreased during the 1970s (1.0×10^{-4} vs. 6.0×10^{-5} respectively for the two five-year periods). Exposure rates can take into consideration not only the number of participants, but also the number of practices, number of hours per practice, and the number of actual sporting attempts depending on the degree of sophistication of the measurement of exposure. An advantage of this technique of expressing risk is that different sports or different dimensions can be compared on a rate basis. For example, Reif (1981) estimated that, while the risk of death in collegiate football was one in 33,000 exposures, the risk of injury or long-term disability was as high as 1 in 18 exposures. In this estimate, exposures were based on a per year basis in which 25 days of participation per year were assumed.

Overuse Syndrome Injuries

Overuse injuries are the result of purposeful, repetitive training. They are clearly injuries although they are not accidental. In fact, they are clearly predictable and often endured specifically in the quest for higher levels of performance. Monitoring overuse injuries was once restricted to adult activities, often in the form of bursitis and tendinitis afflicting the construction worker, clerical worker, or weekend tennis player. Now, they are seen with increasing regularity in highly trained children.

According to Micheli (1986), children are particularly susceptible to these types of injuries for two reasons. First, the growing cartilage of the joint surfaces may be more susceptible to stress, especially shear stresses both in terms of single impact trauma (e.g., growth plate fractures) and repetitive microtrauma (e.g., Osgood-Schlatter disease, patellofemoral stress syndrome). Second, the process of growth itself renders children more susceptible to certain injuries. As growth occurs in the bones, the muscle-tendon unit spanning the bones and the joints becomes progressively tighter with growth, particularly during growth spurts. This reduced flexibility heightens the child's chances of both single impact injuries and repetitive microtrauma because of increased tension across the joints and growing surfaces.

Understanding the Injury Problem

Effective understanding and control of the injury problem in physical education and sport requires a multistep approach. A model for analyzing injuries in sport is presented in Figure 1 (see next page).

Define existing programs

First, the specific programs to be analyzed must by designated. At first glance, this step may seem obvious; on closer inspection, a variety of complicating factors become evident. If, for example, you wish to analyze football in terms of injury occurrence, you must decide what constitutes "football." Does your study include only organized programs? Will you include instructional classes, intramurals, or "sandlot" games? Are you looking only at injuries during games or will you also include practices? The problems associated with collecting data from organized programs are likely to differ from those encountered while collecting data from parks, playgrounds, and "sandlot" football.

In addition, you must decide if you are interested in injuries both directly and indirectly attributable to the activity or sport. For example, an injury resulting from tackling is likely to be directly the result of playing football, while a stroke occurring to an athlete on the sidelines may be unrelated to the individual's participation in sport. Other injuries my be caused by a combination of factors, some direct and some indirect. Heat exhaustion may be attributable both to weather conditions and to the wearing of heavy uniforms and the intense training regimens during high heat/humidity conditions.

Monitoring and Data Collection

Once the conditions defining the sport have been specified, an analysis of injury patterns requires an accurate monitoring of the frequency, type, and severity of injuries as well as the circumstances under which they occur. Here again, the problem of definition arises. What constitutes an accident or an injury? Depending on the purpose of the monitoring institution, the definitions of injuries may differ dramatically. A coach concerned about the welfare of young athletes may define an injury as a bruise which creates discomfort. An organization concerned about medical treatment may define injury as any physical problem which requires medical treatment. A league concerned about the severity of accidental injury may define an injury as any physical problem which requires the athlete to miss a day or more of training or competition. The data collected under each of these examples may be quite different and reflect decidedly different patterns.

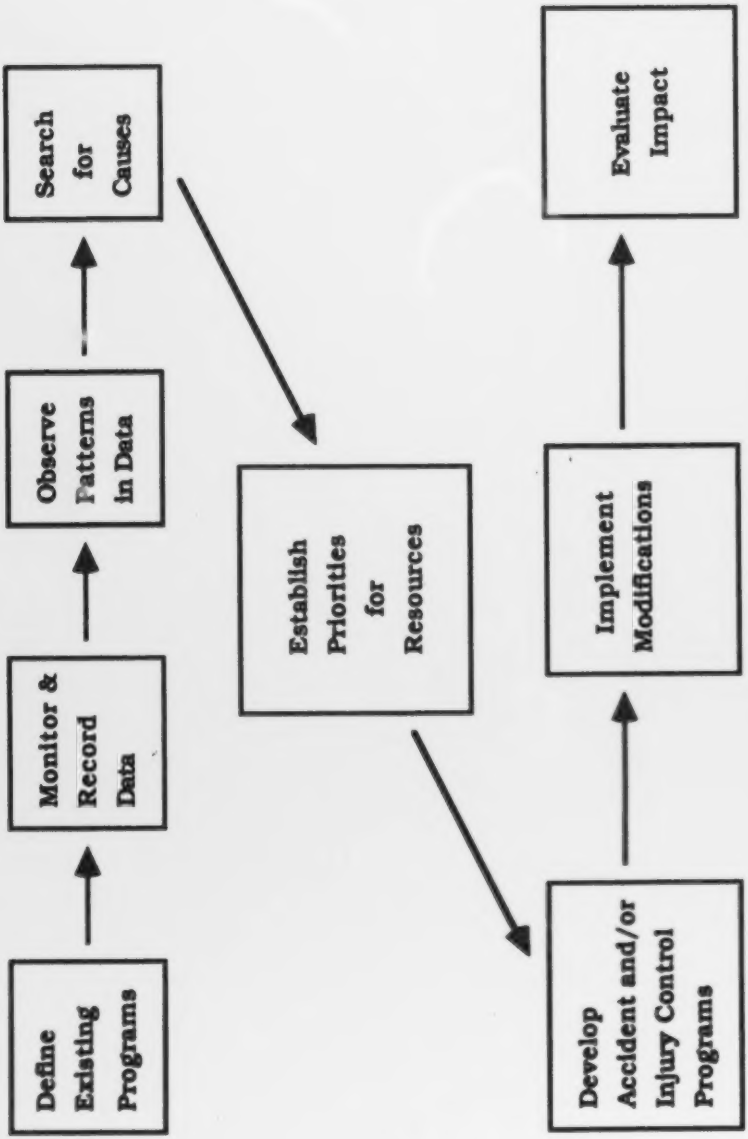

Figure 1. A Model for Analyzing Injuries in Sport

The collection of accident and/or injury statistics appears deceptively simple. Even assuming that clear and adequate definitions of accident and injury have been established, the substantial problems of collecting, storing, and retrieving data remain. Not only must data forms be developed and provided (sample forms are presented in Chapter 3), but the responsibility for reporting the data must be assigned to specific individuals who have the authority to obtain the appropriate descriptive data. Data collection requires many costs in terms of time, effort, and material supplies—not to mention time away from other tasks often thought to be more pressing.

Subtle and not-so-subtle distortions of injury data are quite common. Coaches and administrators often feel pressure to portray their programs in as positive a light as possible. Documenting injuries often appears to be self-defeating to people held responsible for safety. An administrator who introduces an effective injury reporting system should be prepared to explain to superiors why a dramatic increase in injuries is now being recorded! Even the athletes themselves often minimize the reporting of injuries in order to avoid playing restrictions. Failure to complain and direct avoidance of reporting injuries are major factors distorting accurate injury surveillance data.

Pattern Analysis

An examination of the data often reflects patterns which are not obvious to the casual participant because these patterns occur over long periods of time or across large populations of athletes. For example, Sands (1984) found that women collegiate gymnasts were significantly more likely to be injured in November and January than in any other months of the season and that the most common types of injuries occurred from the knee down. Further, heavier, taller gymnasts were more prone to injury than lighter, shorter gymnasts

Some of these findings are obvious. Few coaches would be surprised to find that heavier gymnasts are more prone to injury. Other findings are not so obvious or easily interpreted. The answer to why injuries occur more often in November and January requires further information and analysis. Klafs and Arnheim (1981) concluded that injuries in high school sports were more likely to occur during the first three to four weeks of practice because athletes frequently lack flexibility, are overweight, or have little cardiovascular conditioning when they first report to practice.

The Little League's analysis of injury patterns in organized youth baseball revealed a number of obvious and nonobvious factors contributing to injury. Klafs and Arnheim (1981) suggested that "the result has been the elimination of steel spikes and the on-deck-circle, screening dugouts, mandating the use of face and head protectors for the batters, and installing break-away bases, all of which have resulted in a decrease in injuries" (p.9).

Determine Causes

Once the descriptive data have indicated certain patterns, the cause of the patterns must be determined. Why do injuries typically occur during the third and fourth week of training? One possible explanation might be that this is the period during which athletes are shifting their training emphasis from conditioning to sport specific game skills. An equally plausible explanation might be that during the fall sports season, the third and fourth weeks are a period during which the athletes are more tired and distractible; they have switched from a summer schedule to a winter schedule in which they are attending academic classes as well as training on the athletic field. In fact, both of these reasons, in combination with others, might be causing the increased rates of injuries. Multiple causation of a class of injuries is more often the case than not. Attributing the "cause" of injuries to a single antecedent event is often incomplete if not directly misleading.

Some safety experts believe that the human element is the fundamental cause of virtually all accidents. Such a belief focuses on controlling human behavior as the main basis for reducing accidents and injuries. Safety education programs, reward and punishment contingencies for safe and unsafe behaviors respectively, and the identification of accident prone individuals are all safety approaches which rely on the assumption that human frailties create accidents and injuries.

Clearly, there are circumstances in which human error leads to increased accident and injury rates. Individuals who lack knowledge of accepted safety practices may be more prone to injury. For example, athletes who have not been taught the fundamentals of falling safely appear to be at a higher risk than athletes who possess such skills. Nonetheless, the assumption that teaching falling automatically leads to reduced risk is unwarranted. Athletes who feel in control of the risk because they believe their skill at falling protects them may actually attempt more risky maneuvers and thereby increase their exposure to risk. The fact that as many accomplished swimmers as nonswimmers drown each year suggests that increased skill does not guarantee a reduced accident rate.

Furthermore, unsafe behavior may occur even though the individuals possess an awareness of what constitutes safe behavior. When safe behavior in inconvenient, uncomfortable, "unheroic," or reduces one's effectiveness at the sport, unsafe behavior becomes predictable. Often the value of behaving safely is less prominent than the value of the unsafe behavior. For example, the absence of injury is more difficult for a soccer player to observe than the fact that he or she can run faster without shin guards. In such cases, coaches and administrators must arrange the circumstances so that the athlete realizes that safety is important. For example, a rule which bars any soccer player from

playing unless proper equipment is worn will demonstrate the need to wear shin guards.

While careless human behavior may often be the culprit in creating accidents and injuries, perceptive analyzers of safety should also be alert to opposing points of view. Robertson (1983) pointed out that although many "experts" insist that the injury problem is essentially a human behavioral problem, some of these opinions may be deliberately self-serving. That is, such opinions are offered by those who manufacture or provide the hazardous equipment and/or activity and, thus, who may wish to avoid regulation and being held responsible. Such biased perspectives may also come from the "human services" sectors such as educators, behavioral scientists, police, and others who benefit from labor-intensive behavior-change programs.

As Robertson (1983) stated:

> The wide-spread acceptance of the premise of correctable human error cannot be entirely attributed to brainwashing by those with obvious self-interests, however. The assumption that human beings are for the most part rational actors in complete control of their actions is embedded in our mores and laws. To question the assumption is to question both a cultural theme and a basis for self-esteem. It is true that in many contexts this cultural myth is harmless. Where split-second decisions mean the difference between life and death or health and disability, however, as is frequently the case in handling highly concentrated energy, reliance on the myth of the rational, fully informed, constantly alert, lightning quick human being is, paradoxically, an irrational act (p. 65-66).

Establish Priorities

Clearly, some types of injuries warrant more concern than others. Fatalities need to be dealt with at a higher priority than minor cuts and abrasions. Acquired immune deficiency syndrome (AIDS) and human immuno-deficiency virus (HIV), on the other hand, are conditions that have recently required renewed attention to cuts and abrasions relative to the safety of participants in athletic events. Some injury prevention is also more feasible and/or requires less investment of resources. Providing access to water during training in order to reduce heat stroke requires less of a resource investment than building a foam pit for safe landings in high-risk gymnastic skills.

While arguments over the value of a human life have both philosophic and practical overtones, the issue is one which goes beyond the scope of this chapter. (The interested reader is referred to Thygerson, 1986, Chapter 6.) Anyone who feels that practical value considerations are not a current issue is invited to sit in on a jury trial in civil litigation following an accidental death.

Develop Effective Prevention Programs

Haddon (1980) outlined ten strategies for controlling injuries once the causes of those injuries have been determined. Those who use this list to analyze injury control options should realize that effective analysis requires that all options be initially considered. While some options are already in use or can be easily applied, others appear difficult, if not impossible, to implement and are often casually dismissed during the initial stages of injury-control analysis. The practical aspects of implementation should be set aside until after all possibilities have been outlined.

1. **Eliminate the hazard.** Sports injuries can certainly be reduced by eliminating the sports or activities which cause injuries. While few would advocate the wholesale elimination of sport, there are a variety of examples where steps have been taken to eliminate specific sports. In 1977, the American Academy of Pediatrics advocated that trampolines be banned from instructional programs and eliminated as a competitive sport. Periodic cries for the elimination of boxing (usually prompted by a death) are relatively commonplace. The swinging rings in gymnastics have been eliminated both in physical education classes and in competition. In a different venue, commercial motels and hotels throughout the United States have virtually eliminated diving boards from their recreation swimming pools. A less dramatic interpretation of this strategy might include the elimination of select parts of activities. For example, eliminating the full contact aspect of tackle football to play touch or flag football would be a way to "eliminate" hazards while preserving the spirit of the game.
2. **Reduce the amount of hazard.** Often sports have been modified to reduce the amount or degree of risk incurred by the participants. This strategy involves a quantitative intervention. That is, the basic nature of the activity is not changed; participation is simply scaled down. For example, young platform divers train and compete on 5, 6, and 7 meter platforms rather than the 10 meter tower required by international rules. Limiting the degree of vertical drop on novice ski trails to intentionally curtail the speeds which beginner skiers can attain reduces the amount of hazard. Similarly, shortened playing periods, age categories, and weight classes for young, less experienced players provide a quantitative degree of hazard reduction.
3. **Prevent or reduce the likelihood of the release of already existing hazards.** In this category of interventions attention is focused on changing the conditions under which the activity will continue to be performed. In gymnastics, for example, performers are concerned about slipping off of some pieces of apparatus. To be competitive, performers must include skills in their routines that involve the risk of unexpectedly leaving the

apparatus. The use of magnesium carbonate ("chalk" or "mag") by gymnasts to reduce the likelihood of slipping is an example of one approach to reducing the likelihood of such an occasion.

4. **Modify the rate or spatial distribution of the release of the hazard from its source.** In some activities, hazards exist as part of the nature of the activity and will never by totally removed. One can, however, take steps to reduce the amount of force that such hazards can exert on the body. In skiing, for example, participants will fall and risk twisting or even breaking ankles, knees, or other body parts. One of the major problems encountered when falling is that the skis may force the low extremities to bend in unplanned ways. The use of rapid release bindings on skis which are adjusted to the skill level of the performer is an example of this principle. A similar example is seen in the use of seat belts in motor vehicles.
5. **Separate, in time or space, the hazard and the participant.** Providing bicycle and jogging paths which are isolated from streets and highways separates the hazards (faster vehicles) from the participants (cyclists and joggers). The separation of spectators, benches for nonplaying athletes, and an equipment storage area from the playing field also reduces the likelihood of injuries caused by colliding with other players or objects after running out of bounds. Likewise, isolating playing fields from such potential hazards as streams, roads, and construction sites reduces the potential for accidents and injuries.
6. **Interpositioning of material protective barriers.** Football and lacrosse helmets, gymnastics mats, chest protectors in baseball and fencing, protective eye glasses in racquetball and squash, and mouth guards in contact sports are prime examples of the use of such a strategy.
7. **Modify the basic relevant qualities of the hazard.** Children often fall on playgrounds. The hazard in such situations is the actual surface of the playground in that hard surfaces and soft skin and bones are bad matches. The surfaces of playgrounds and playing fields can be covered with materials which are softer than asphalt, concrete, or crushed stone. One relevant quality of the hazards found on a playground is the degree of softness of the playground surface. Making the surface softer would be an example of an appropriate modification in this category.
8. **Make what is to be protected more resistant to damage.** Conditioning athletes to be stronger and more flexible decreases their susceptibility to certain types of injuries. Providing unlimited access to water and gradually increasing workout intensity during periods of high temperatures allows the athletes to become acclimated and more resistant to heat disorders.
9. **Counter damage already done.** Emergency first aid training to stop bleeding and CPR training to restore heart function and breathing are funda-

mental to effective sports medicine programs. Recognizing potential spinal injuries and knowing that immobilization of such injured athletes is essential to prevent further injury is a prime example of preventing further damage resulting from a sports injury. Well-situated, well-trained, and well-equipped professionals ready to respond quickly can make substantial differences in the fatality rate and the severity of damage occurring from traumatic injuries.

10. **Stabilize, repair, and rehabilitate the damage.** Rehabilitative physical therapy programs, reconstructive surgery, and the use of knee and ankle braces to facilitate recovery from sprains and strains illustrate this approach.

Implement Safety Modifications

Knowing the cause of a type of injury may suggest a variety of prevention techniques, not all of which are equally effective. Knowing, for example, that being hit in the chest with a baseball or softball is the major cause of death among baseball/softball players suggests that chest protectors may be warranted. Getting players to actually wear such protective devices is yet another matter. Implementing programs often requires much lead-time and substantial resources. Resistance to change also impedes the effectiveness of prevention programs. While the use of face masks for goalkeepers and helmets for all players is now accepted in ice hockey, during the early stages of implementation this was resisted by players and coaches alike. Paradoxically, the implementation of effective injury reduction programs is most difficult in areas in which the individual participant carries the most responsibility for his or her own safety.

Assess the Influence of Prevention Programs

Again, the monitoring of ongoing programs is required in order to assess the effectiveness of prevention programs. Often the frequency of injury experienced by an individual instructor, participant, or program is so small that patterns are difficult to detect without a recordkeeping system which extends over a period of years and across many similar programs. Addresses and phone numbers of several data collection organizations are included in Appendix A to this chapter. Individuals may contribute their statistics to the larger data base, compare their statistics to data from the larger data base, or gain insights into potential problem areas identified through the existing data to modify prevention programs.

Researchers at the University of North Carolina have compiled statistics of football fatalities annually since 1931. The pattern of injuries in high school

football programs, plotted in five-year blocks between 1961 and 1990 is shown in Table 2. There has been a steady decrease in the number of fatalities directly related to football since the peak observed between 1961 and 1965. A similar decline has occurred in indirect fatalities during this same period. While a variety of factors have contributed to this steady decline, a significant rule change was implemented in 1976. Initial contact with the head while blocking and tackling (spearing) was ruled illegal. This rule change was introduced not only because of an awareness of fatalities in football, but because statistics revealed that the vast majority of fatalities since 1960 were due to injuries to the head and neck. This information led to the development of a prevention program involving protecting this area of the body via improved equipment and rule changes to eliminate the use of the head as a tackling technique.

Continued monitoring of injury frequencies indicated that such programs have achieved the desired effect of reducing injuries and fatalities. Penalties for spearing and rigid enforcement of those penalties plus an increased awareness on the part of coaches and athletes regarding the nature and severity of injuries produced by spearing have all contributed heavily to the reduction of fatalities resulting from head and neck injuries. Data continue to indicate that deaths in football, although significantly reduced in number, are still primarily caused by head and neck injuries, and efforts continue to develop even more effective prevention of such injuries.

A Practitioner's Analysis

The professional in sport and physical education can gain an understanding of the factors which should be controlled by using a simple, yet effective approach to analyzing the safety requirements of the program. While the number of specific concerns to which attention must be focused can be overwhelming, virtually all can be subsumed under the following classification plan. When analyzing a specific program, ask the following three sets of questions:

1. **Are the athletes prepared for the activity?** Has there been a medical screening? Have they been properly conditioned for the demands of the sport? Have they been taught the appropriate prerequisite skills? Have they been taught to appreciate the risks inherent in their particular sport? Have the basic safety regulations been taught to them in terms they can understand? Has the instructor/coach clarified exactly what is expected of the athlete during the learning and/or performance stages?
2. **Is the instructor prepared to teach the skill and supervise the activity?** Does the instructor have the prerequisite knowledge of the biomechanical and teaching progressions of the skill? Is the instructor capable

of individualizing the learning sequence and teaching progressions to accommodate the athlete's needs, both real and imagined? Is the instructor aware of the common errors made by beginners and the likely hazards to be confronted by both the student and the instructor during the learning of the skills? Is the instructor familiar with the level of mental and physical preparation of the athlete and can the instructor modify the learning progressions to match the learner's preparation with the difficulty of the task?

3. **Is the environment adequately prepared for the performance of the skill?** Is the protective equipment available and properly positioned? Is the apparatus and/or protective equipment properly adjusted for the athlete? Has the activity been properly designed for the space, lighting, facilities, and number of athletes available? Have the athletes been properly matched for size, skill, and maturity? Have activity areas been clearly defined and separated from traffic lanes, resting stations, and teaching stations?

Clearly, the number and type of questions which one can ask under each heading has not been exhausted. Questions depend on the specifics of the activity taught and the degree of risk associated with that activity. This strategy does, however, provide direction in terms of systematically examining the three primary areas in which teachers and administrators are responsible for providing adequate care and supervision for their students.

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Appendix A

The following is a partial registry of agencies which provide statistics describing injury patterns related to youth sports. While not complete, it does provide sources for valuable information on youth sports injuries

American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103
(215) 299-5585

Big Ten Injury Surveillance Survey
1189 Carver Pavilion
University of Iowa Hospitals
Iowa City, IA 52242
(319) 338-0581, ext. 425

Division of Injury, Epidemiology, and Control
Center of Environmental Health and Injury Control
Centers for Disease Control
Atlanta, GA 30333
(404) 488-4690

Interscholastic Athletic Injury Surveillance System
International Institute of Sports Science and Medicine
1199 Hadley Road
Mooresville, IN 46158
(317)831-2273

National Academy of Sports Vision
200 South Progress Avenue
Harrisburg, PA 17109
(717) 652-8080

National Head and Neck Injury Registry
University of Pennsylvania Sports Medicine Center
Weightman Hall E-7
235 South 33rd St.
Philadelphia, PA 19104
(215) 662-4090

National High School Athletic Injury Registry
National Athletic Trainers' Association, Inc.
Box 3548
Oak Park, IL 60303
(312) 386-1610

National Injury Information Clearinghouse
US Consumer Product Safety Commission
5401 Westbard Avenue, Room 625
Bethesda, MD 20816
(301) 492-6424

National Safety Council
444 North Michigan Avenue
Chicago, IL 60611
(312) 527-4800

National Society to Prevent Blindness
Manager, Eye Safety Programs
500 East Remington Road
Schaumberg, IL 60173-4557
(312) 843- 2020

New York State Public High School Athletic Association
88 Delaware Avenue
Delmar, NY 12054
(518) 439-8872

Regional Spinal Cord Injury Systems
National Spinal Cord Injury Statistical Center
University of Alabama at Birmingham
University Station
Birmingham, AL 35294
(205) 934-3330

Youth Sports Research Council
Rutgers University
New Brunswick, NJ 08903
(908) 932-6537

Water Safety Services
1882 Techny Road
Northbrook, IL 60062
(312) 480-9830

2

Legal Responsibility for Safety in Physical Education and Sport

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The number of lawsuits brought against physical educators and coaches has reached an unprecedented high point and, from all indications, will continue to rise in the foreseeable future. Consider the following reasons why this may be the case:

- The overwhelming majority of all school-related injuries occur in conjunction with physical education and sport.
- A tort is a legal wrong for which one may seek recompense through legal action.
- Under the civil laws of the United States, it is possible for practically any person to sue any other person at any time for any reason. While the outcome of the suit is by no means guaranteed, the right to initiate it is virtually unquestioned.
- The overwhelming majority of all negligence suits are settled prior to the completion of the trial process.
- Both the number of lawsuits and the size of the settlements or awards has increased dramatically in the last several years. This has, of course, been reflected in the cost and availability of liability insurance as well as the nature and continuation of many programs.

The field of physical education and sport unquestionably carries with it a higher risk of injury than most other areas of the curriculum. The relative ease with which one can institute a lawsuit and the high likelihood of the strength of the case have led to an increasing level of professional concern over issues related to risk management and liability.

While there are many negative aspects to the liability problem, such as spiralling insurance costs and the loss of some programs and activities, the increased concern over liability has also resulted in safer programs and has been used by knowledgeable teachers and administrators as a highly persuasive argument for program and facility improvements. Further, although no amount of planning or preparation can guarantee freedom from injuries and subsequent lawsuits, a thorough understanding of the legal process and the elements of risk management can greatly increase one's chances of success when such a situation arises. This chapter will, therefore, examine the fundamentals of the legal process as they relate to physical education and sport. Those factors which most commonly give rise to lawsuits will be discussed in sport specific safety principles dealt with in the remainder of the text.

The Legal Process

Tort claims in physical education and sport are primarily the result of personal injuries caused by the alleged negligence of the teacher or the coach. In order for the plaintiff or injured party to prevail in such a suit, several elements must be proved by the greater weight of evidence.

Duty. The defendant must be shown to have had a responsibility to provide for the safety and welfare of the plaintiff. If the injured party was a student in the defendant's class, or a player on his/her team, then the duty is virtually assured.

Breach of duty. It must be shown that the defendant failed to provide the standard of care which could reasonably be expected of a professional under the same or similar circumstances. A duty can be breached either by omission or by commission. That is, the defendant either failed to do something that he/she should have done, or did something he/she should not have done.

Damage. In order to institute a tort claim, the plaintiff must have suffered an actual loss to his/her person, property, or interest.

Foreseeability. It must be shown that the defendant should have been able to predict the likelihood of an accident or injury arising out of the specific circumstances in question.

Proximate cause. The mere presence of an act of negligence is not sufficient grounds to allow the plaintiff to prevail. It must be shown, further, that the injury for which recompense is sought was actually caused or aggravated by the specific act of negligence in question.

A key point in this entire process is the establishment of the standard of care required of the defendant. In this regard, the prudent person principle is most commonly employed. We are obligated to perform as would a reason-

ably prudent individual under the same or similar circumstances. While this statement is essentially correct, remember that it is also very superficial. The yardstick by which professional conduct will be measured in court is the established standards and practices of the profession as applied and explained by a prudent professional—an expert. It is essential, therefore, that we take every reasonable precaution to guarantee that our teaching and coaching behavior always meets or exceeds the currently accepted practices and procedures of the profession

Legal and Quasi-legal Defenses

There are several legal arguments and professional procedures which can help to form the basis of a defense in the event of a lawsuit. While these are useful tools in the litigation process, they are even more valuable as indices of administrative and supervisory responsibilities with regard to risk management.

Contributory/comparative negligence. In states which adhere to the principle of contributory negligence, the plaintiff is barred from recovery if it is proved that his/her own negligence helped to cause or aggravate the injury. In the majority of states, however, the doctrine of comparative negligence is now applied. In such a situation, the jury will be asked to apportion a relative percentage of responsibility to the plaintiff and to the defendant(s). The size of the award which the plaintiff could receive would then be diminished by his/her percentage of responsibility. If, for instance, Mary Addams was seeking $250,000 damages for an injury sustained in a soccer class, and if the jury found her to have been comparatively negligent in the amount of 45%, then the maximum award she could receive would be 55% of $250,000, or $137,500. Obviously the amount of responsibility which a student can assume for his/her own welfare is a function of age, intelligence, skill, and background in the activity. In general, the more thorough the instruction, the more explicit the warnings, and the more consistent the feedback, the more the students will be expected to assume some reasonable share of the responsibility for their own safety.

Assumption of risk. It is often argued that an individual who takes part in certain types of vigorous physical activities must assume the risk of accident or injury which is normally associated with that activity. Assumption of risk, however, is a technical term which many feel has no validity as a separate defense. Reduced to simplest terms, no one can be expected to assume a risk of which he/she is unaware. If the teacher fails to warn the student of the dangers involved in the activity and/or fails to guarantee the level of instruction, skill, and feedback necessary for the student to reasonably protect him/herself from those dangers, then the teacher may very possibly have been

negligent in the fulfillment of his/her duties and the student cannot be held to have assumed any risk or responsibility. If, on the other hand, the student was properly instructed, warned, and provided with reasonable feedback regarding his/her performance, and despite this, acted in a manner which increased the likelihood of his/her own injury, then there may be grounds for a valid claim of contributory or comparative negligence. In either case, however, the assumption of risk terminology is merely excess verbal baggage which has no real place as a separate defense in today's law.

Informed consent. While written document such as waivers and permission slips cannot provide absolute legal protection from our own acts of negligence, they can, when properly understood and executed, be very useful tools in the reduction of liability.

For our purposes as physical education teachers and coaches, the most commonly used informed consent documents can be grouped into two major categories: release forms, often called waivers, and participation agreements, which include permission slips.

Release. A release or waiver is a contract, signed by the participant and/or his/her parents, which purports to absolve the teacher or coach from liability in the event that an accident or injury arises from some specifically named activity. Waivers have very little absolute legal value for several reasons: (a) The courts are reluctant to allow one to be contractually protected from the consequences of one's own negligent actions; (b) since no person can legally waive the rights of another, parental waivers executed on behalf of a minor child cannot be held valid; and (c) the requirement of a release prior to participation in a public program is frequently held to be a violation of public policy and, therefore, invalid.

Participation agreement. A participation agreement is of particular value in circumstances where a release or waiver cannot apply. It is, in essence, a signed statement indicating that the participant and/or his/her parents understand the dangers which are inherent in the activity, know the rules and procedures and the importance of following them, fully appreciate the possible consequences (i.e., specific types of injuries or even death) of the dangers involved and, knowing all this, requests to participate in the activity. Van der Smissen (1985) has indicated that, in order to be effective, participation agreements should meet the following criteria:

1. They must be explicitly worded.
2. If there are rules that must be followed, it is preferable that the rules be listed in the agreement or listed on the reverse side of the paper.
3. The possible dangers inherent in the activities must be spelled out in detail, along with the consequences of possible accidents to the participants.
4. The participant must sign after a statement expressly assuming the risks of the participation.

While a participation agreement will not prevent a lawsuit or absolve the teacher or coach of the responsibility for his/her negligence, it clearly establishes the awareness level of the participant and his/her willingness to assume reasonable responsibility for his/her own welfare and compliance with appropriate rules and procedures. It can, therefore, be a very valuable tool in the establishment of a contributory or comparative negligence defense.

Risk Management

The best possible means of avoiding costly liability claims and judgments is by recognizing those circumstances in which injuries are most likely to occur and by taking appropriate steps to eliminate or minimize the chances of their occurrence, that is, through a carefully applied process of risk management.

Most activity-related lawsuits allege that the teacher or coach was negligent in the fulfillment of his/her professional responsibilities with regard to one or more of the following areas: supervision, selection and conduct of the activity, and environmental conditions. This is not surprising since it is possible, through careful analysis of these areas, to identify virtually all controllable injury causing factors within an activity. For this reason, the areas of supervision, selection and conduct of the activity, and environmental conditions provide an excellent organizational focus for a general program of risk management and prevention as well as for identifying specific safety principles within individual activities.

Supervision

The structure of the educational environment and the nature of the students dictate the absolute necessity for effective supervision. A skilled supervisor (teacher, coach, group leader, etc.) can, in the normal course of his/her duties, prevent many needless accidents. Effective supervision is, therefore, recognized as an essential element in the delivery of safe and successful programs of physical activity and is called into question virtually every time a negligence suit is instituted. In developing educational programs, therefore, it is necessary to provide a sufficient number of supervisory personnel to manage the group in question, and to ensure that the supervisory personnel employed possess the necessary knowledge and skills to fulfill their responsibilities.

The individual teacher or coach is responsible for the provision of both general and specific supervision. The broad overall supervision of a class or team is referred to as general supervision. In providing effective general supervision, one is expected to maintain visual contact with the entire group, to be immediately accessible to them, and to apply a high level of professional skill

in the detection and remediation of deviations from safe and prescribed procedures. Specific supervision, on the other hand, refers to situations of direct interaction between the teacher and one or more students. Direct supervision might be required in order to correct some noted deviation from safe practices or procedures, to provide individual feedback, or to lend direct assistance when a student is about to attempt a new or particularly dangerous skill. The intensity and specificity of the supervision is inversely proportional to the ability of the student to understand and appreciate the dangers of the activity, to assess his/her performance and skill level, and to adhere to required safety procedures. Generally speaking, therefore, as the age and ability of the students decreases, the need for specific supervision can be expected to increase and the advisability of allowing extended periods of time with only general supervision can be expected to decrease.

Decisions regarding the relative proportion of general to specific supervision are, of course, dependent upon the particular group and situation in question. It should be remembered, however, that the need to provide specific supervision to one or more individuals does not remove the need to provide general supervision for the remainder of the group. The teacher cannot, therefore, become so engrossed in providing individual feedback to students in the northeast corner of the gym that he/she fails to detect and correct the hazardous situation which may be occurring in the southeast corner.

The following general guidelines should prove helpful as you seek to provide effective supervision for all activities:

1. Take whatever steps may be necessary to guarantee your own competence in the activity being taught. You must be the expert!
2. Establish general safety rules for the gymnasium, locker rooms, etc. Rules should be explained to the students, posted, reinforced, and consistently enforced.
3. Develop the habit of writing detailed lesson or practice plans. The act of planning will help to identify and correct many potential hazards. Moreover, the plans themselves can serve as valuable legal evidence of your preparation and knowledge with regard to the subject matter as well as the preparation of your students.
4. Never leave your class or team unsupervised. A quick phone call in the office or a brief stop in the equipment room to retrieve some forgotten item presents a period of supervisory absence and, thus, is a potential source of negligence. In such a case, if it is determined that the presence of the teacher would have resulted in the correction or the prevention of the injury-causing behavior, then the injury sustained by the student can be proximately related to the negligence of the absent teacher.
5. Take care to arrange your classes so that the entire group is within your field of vision. Move about the area in a manner which maximizes student

contact and minimizes the length of time during which your back may be turned to any portion of the group.

6. Be sure to secure the facilities and equipment when they are not in use. If facilities are left open and equipment is left out, it is reasonable to expect people to use them. Unplanned and unsupervised activities of this nature frequently lead to injuries and lawsuits.
7. In the event of an emergency, you will be expected to render necessary first aid until appropriate emergency personnel (trainer, nurse, doctor) arrive. Be sure that you are adequately prepared to do so.
8. Establish a list of emergency procedures to be followed in all accident cases. This will prevent student confusion, unnecessary delays in treatment, and supervisory breakdowns. Who goes for help? Who supervises the class? How is he/she contacted? What do the unaffected students do?
9. The actions of one or more students should never be allowed to endanger the safety or interfere with the learning of others.

Selection and Conduct of the Activity

As professionals we are expected to select activities which are appropriate for the age and ability levels of our students. Having selected an appropriate activity, we are further expected to provide instruction which is factually accurate and presented in a manner which maximizes the likelihood of student success. This instruction should be supplemented by warnings with regard to any potentially hazardous conditions involved in the activity, the provision of appropriate safety devices and protective measures, and the provision of feedback through which the student can gauge and modify his/her performance.

The courts have been relatively consistent in their recognition of the fact that very few activities are inherently unsafe. The issue in question, therefore, should an injury occur, is whether the injured student was physically capable of successful participation and was properly prepared and instructed. While certain risks may be deemed necessary in the interests of good programming and total student development, such risks must be well thought out and justified, and the potential for student injury must be minimized.

The following guidelines should be considered when selecting and developing any activity.

1. Always select activities which are within the reasonable ability limits of the students.
2. Readiness is an individual matter. Pretesting and screening, careful record keeping, and the development of individualized progressions are, therefore, essential to safety and success.

3. The development and maintenance of comprehensive lesson plans and curriculum guides is essential both to instructional success and to a sound legal defense in the event of a lawsuit. They provide evidence regarding the nature and organization of the instruction as well as previous student experiences and background.
4. Always have planned rainy day activities to correspond to planned outdoor activities. It is both difficult and embarrassing to try to justify an injury occurring in an ad libbed activity which had to be pulled together because an outdoor lesson was rained out.
5. All activities should be justifiable within the context of the educational objectives of the school. Too frequently, activities selected solely on the basis of expressed student enjoyment are not particularly enjoyed by all and result in needless injuries. Such injuries are very difficult to justify.
6. Procedures should be developed for the acceptance of medical excuses and for return to activity after serious injury or illness. Never allow an injured or ill student to participate without a medical clearance.
7. Do not attempt to coerce students to perform when they are, by their own admission, fearful or unequal to the task. Such action is almost impossible to justify when it results in an injury.
8. Provide all necessary protective measures and devices, and require their use.
9. If adequate protective measures cannot be provided, then the activity itself should be modified.
10. Be sure that all instruction is consistent with the most professionally accepted information and procedures and includes warnings regarding the dangers involved and the manner in which they can be avoided or minimized.
11. Take whatever steps may be necessary in order to avoid mismatch situations in activities where there is a strong likelihood of physical contact. It should be remembered, however, that a mismatch is a function of size, strength, skill, and experience. The sex of the participant is not a controlling factor.
12. Above all, remember that the focus of the educational process is the student, not the activity. Our responsibility, therefore, is to tailor the activity according to the skills of our students in order to provide the safest and most productive learning experience for all.

Environmental Conditions

In addition to providing a safe activity under competent professional supervision, one must also take appropriate measures to provide for the safety of the facilities and equipment used. Before allowing students to use an instructional

area or a piece of equipment, it should be carefully inspected for safety and proper function. Such things as debris or potholes on playing fields or loose racquet heads can lead to participant injuries. When this occurs, the teacher/coach will, almost invariably, be called upon to explain the procedures he/she followed in order to prevent injuries due to unsafe environmental conditions.

While obvious hazards such as water on a court surface or a cracked bat usually result in immediate remediation, many teachers unknowingly create environmental hazards by the manner in which they use an otherwise safe facility. Instructing students to run across the gym, tag the far wall, and return, for instance, is simply inviting an injury due to a collision with the wall. This is not the fault of the facility. It is a function of the manner in which the facility is used. Similar situations can be seen where one fails to provide a sufficient buffer area around a playing field or court. Participants must be expected to run out of bounds and beyond finish lines. A sufficient buffer zone is, therefore, essential to safe play. Other teacher imposed and easily corrected environmental hazards include: relays where the turning directions and running lanes have not been clearly specified; the use of improper substitute equipment such as candy wrappers for bases; or the use of equipment which requires a level of skill beyond that of the participants. An example of the latter circumstance would be the use of fixed post bases with unskilled participants where sliding is allowed. While these bases offer distinct advantages with skilled sliders who recognize their unyielding characteristics, they are unsafe for those who lack such skill and knowledge. If, therefore, they were to be used with an unskilled group, sliding should be disallowed in the interest of safety.

The following general guidelines should prove helpful in reducing the number of injuries due to hazards within the environment.

1. Start every day with an inspection of the facilities which your classes will be using. Note any hazards such as broken glass, slippery surface, loose fittings, etc., and take steps to eliminate them.
2. Make appropriate planning modifications to keep students away from hazardous areas until repairs can be completed. If a problem is located in a general use area, consider some form of marking as a warning to others.
3. All equipment in use should be inspected daily.
4. Teach students to inspect equipment and require them to do so each time it is issued. This double check system virtually eliminates the possibility of teacher negligence associated with equipment failure.
5. Under no circumstances should students be allowed to use equipment which is in a state of disrepair.
6. Be sure all facilities and equipment meet or exceed recommended size and safety specifications, e.g., thickness of mats, free area around courts, and landing pits.

7. Do not hold running activities on an uneven or slippery surface.
8. Provide and require the use of appropriate safety equipment. Post signs and reminders to keep the importance of this issue clearly in the minds of the students.

We are living in an age of litigation. Disputes and losses, whether real or imagined, are commonly brought before the courts for adjudication. It is not surprising, therefore, that in a profession such as physical education and sport, where the possibility of participant injury is present, there should be a great concern for matters of legal liability. To the degree that this concern manifests itself in careful attention to standards of safety and professionalism and thoughtful program planning, it is healthy and should be cultivated. Care must be taken, however, to prevent overreaction. It is one thing to eliminate unnecessary risks; it is quite another to eliminate programs or activities entirely because some risk happens to be involved.

Risk is an unavoidable component of sport. It cannot be eliminated, but it must be controlled. The task of the teacher is to eliminate all unnecessary risks, and to reduce as much as possible those that remain. If, after doing this, the educational value of the activity can be shown to substantially outweigh the risks, then the activity has a valid place in the curriculum and should be retained. If, however, the potential risks cannot be justified in this manner or if all reasonable steps have not been taken to guarantee the safety of the participants, then program modifications must be implemented in order to prevent needless injuries and costly lawsuits.

Reference

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3

Administration of Safety in Physical Education and Sports

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The administration of safety in physical education and sport cannot be a fragmented effort. It must be part of the total school safety program with the full participation of the district administration and the local school. A safety program must be designed which is in concert with all aspects of the philosophy, administration, and management of the entire organization.

Regardless of the organization, an effective safety program must encompass:

1. Maximum production.
2. Maximum cost effectiveness.
3. General efficiency.
4. Safety for all involved (this includes students, employees, and other persons and patrons who are involved in the activities of the institution).

Within the educational setting, generally accepted ingredients of a safety program include:

1. Policy development.
2. Safety committee (a physical education teacher or physical education and sport administrator should serve on this committee).
3. Accident reporting and investigation.
4. Safety inspections.

Role of the Administrator

The physical education and/or athletic administrator serves primarily as a facilitator of the official safety policies of the school or school district by ensuring that proper communication channels to each employee, student, and patron are constantly open and operating.

Responsibility for the overall safety of the organization resides in the hands of the institution's chief administrator who appoints general and specific safety coordinators and committees. Specific areas of responsibility must be identified. Physical education and sport are, of course, two very important aspects of the total safety structure and should be delegated to a specific individual who has the training and expertise necessary to succeed at the task.

The primary administrative responsibilities for physical education and/or athletics may be accomplished by several persons or, in fact, may be the task of one person in a small school district.

Regardless of the size or type of education institution, several areas must be addressed by those professionally trained in the field of physical education and sport. Some things to keep in mind are the following:

- Physical educators and coaches should not become overly concerned about legal issues. Rather, they should take positive measures to prevent accidents. The goal is to minimize the frequency and severity of injuries.
- Accidents will never be eliminated. The term "safety measures" in physical education should not necessarily signal elimination of an activity. Taking actions to enhance activity, health, adventure, and fun should be the primary goal. Activity elimination as a means of accident prevention is a negative and often counterproductive approach.
- Recommendations for the purchase of equipment and supplies designed and constructed for optimal safety in the particular situation must be made by trained physical educators or by the athletic administrator.
- Proper maintenance and reconditioning of physical education and athletic equipment must be regularly completed in compliance with the manufacturer's specifications.
- Regardless of the activity, careful and constant supervision of students in physical education and athletics is a must.
- General supervision is also important and this responsibility may fall upon all professionals regardless of their specific assignments. Locker room coverage, for example, is often shared by teachers and coaches.
- Skill classification and proper assignment of the individual physical education student and athlete are very important. Assigning of students to specific positions or modifying the rules are two methods of managing this responsibility.

- Class size is of major importance in physical education. Both the activity and the facility are influencing factors. In general, physical education class size should match that of other subjects, as approved by the school or system.
- Budget constraints can never be justified as reasons for not providing recommended protective equipment. When protective equipment is available, teachers must require its use.

Accident Reporting

We live in a data-oriented society. The accessibility of today's computers has created the demand for detailed reporting and analyzing of all aspects of health and safety. Completion of accident reports is necessary in order to properly interpret information and to eliminate avoidable accidents. The purpose, however, is *not* to eliminate the activity or to reduce the resultant health benefits and fun. Figure 1 is an example of an effective form for reporting student injuries.

Routine Maintenance

Routine preventative and emergency maintenance requests with safety implications should be submitted as soon as needs are identified. Copies of these requests should be sent to all appropriate persons and kept on file by the departmental chairperson/teacher or coach.

Budget Implications

Budget planning is necessary for the successful maintenance and renovation of existing facilities. Safety projections for new facilities must be made in advance. These "capital budget" requests can usually be projected several years in advance. At the same time, accurate justification for need must be documented

There are a number of publications which can be helpful in this area. One such source is *Facility Planning for Physical Education, Recreation, and Athletics* (Flynn, 1993).

Safety Awareness and Foreseeability

Although the ultimate responsibility for the safety of students, employees, and patrons lies within these groups themselves, the search for existing and potential safety hazards is a continuous process in which all physical educators and

Division of Insurance and Retirement
MONTGOMERY COUNTY PUBLIC SCHOOLS
Rockville, Maryland

STUDENT ACCIDENT REPORT

Please read the instructions on the reverse side before completing the following.

SECTION A

(1) Name of Injured _____ (Last Name) (First Name) (Middle Name)

(2) Home Address _____ (Street) (City) (State) (Zip Code)

(3) School Name _____ (4) School Number ☐☐☐☐

(5) Grade ☐☐ (6) Age ☐☐ (7) Sex ☐

(8) Date Occurred ☐☐/☐☐/☐☐☐☐ (Month/Day/Year) (9) Time Occurred _____ _____ ☐ AM ☐ PM

(10) Date Accident Reported ☐☐/☐☐/☐☐☐☐ (Month/Day/Year) (11) Type of Activity ☐☐

(12) Specific Activity ☐☐☐ (13) Location of Accident ☐☐☐

(14) Description of Accident _____

(15) Was an adult present at scene of accident? ☐ Yes ☐ No

(16) Name of Individual _____

SECTION B

(1) Nature of Injury ☐☐.☐☐.☐☐ (2) Part of Body ☐☐ ☐☐ ☐☐

Immediate Action Taken

(3) First Aid ☐ Yes ☐ No, By _____

(4) Sent to Health Room ☐ Yes ☐ No, By _____

(5) Sent to Doctor ☐ Yes ☐ No, By _____ Name of Doctor _____

(6) Sent back to Class ☐ Yes ☐ No, By _____

(7) Sent to Hospital ☐ Yes ☐ No, By _____

Name of Hospital _____

(8) Was Parent, Guardian, or Neighbor Notified ☐ Yes ☐ No, Date Notified ☐☐/☐☐/☐☐☐☐ (Month/Day/Year)

How Notified _____ Time Notified _____ _____ ☐ AM ☐ PM

By Whom _____

(9) Total Number of Days lost from School ☐☐☐ ☐

(10) Student has Accident Insurance ☐ Yes ☐ No

AUTHORIZATION

_____ (Principal's Signature) _____ (Date)

Figure 1. Sample Student Accident Report

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Figure 1. Continued

INSTRUCTIONS FOR COMPLETING THE STUDENT ACCIDENT REPORT FORM

GENERAL

Complete all of the questions and the authorization section. If not complete the form will be returned. Send the original and 2 copies within two (2) weeks to "The Division of Insurance and Retirement" - Educational Services Center. Keep one copy for your files. Examples of reportable accident reports are: All injuries to the head, eye, neck or spine, any bone or joint injury that results in swelling, any puncture wound, burn or laceration that looks as though it may require sutures, ingestion of any drug, chemical or foreign materials and other such accidents.

SECTION A

ITEMS 1 THRU 4 – Must be completed as indicated. **ITEM 5** – Indicate the grade level such as 01, 02, 03 – 12 for Grade one (1) thru twelve (12). Head Start should be shown as "24". Kindergarten as "25". Special Education as "26" and Ungraded as "27". **ITEM 6 – AGE** – State age of student on last birthday. **ITEM 7 – SEX** – Indicate "M" for male and "F" for female. **ITEM 8 – DATE OCCURRED** – Indicate date per example: 06/10/71 – June 10, 1971. **ITEM 9 – TIME OCCURRED** – Indicate the exact time the accident occurred per example: 02:10 = Ten minutes past two O'Clock. Check whether AM (Morning) or PM (Afternoon). **ITEM 10 – DATE ACCIDENT REPORTED** – Indicate per example: 06/21/71 = June 21, 1971.

ITEM 11 – TYPE OF ACTIVITY – Indicate using one (1) of the following codes:

01 Elem. Physical Educ.	03 Elem. Non Phys. Educ. & Non Noon Recess	05 Secondary Non Phys. Educ.
02 Elem. Noon Recess	04 Secondary Physical Educ.	06 Varsity & Jr. Varsity

ITEM 12 – SPECIFIC ACTIVITY – Indicate using one (1) of the following codes:

101 Archery	109 Fencing	117 Parallel Bars/Horizontal	125 Swimming	133 Weight Lifting and Training
102 Badminton	110 Field Hockey	118 Physical Fitness/Calisthenics	126 Swings	134 Wrestling/Self Defense
103 Balance Beam	111 Football	119 Rings	127 Tennis	
104 Baseball	112 Games	120 Skating/Ice and Roller	128 Track and Field	
105 Basketball	113 Golf	121 Skiing	129 Trampoline/Mini. Tramp.	
106 Cheer Leader	114 Jungle Gym	122 Slides and Sensaw	130 Tumbling	
107 Dance	115 Kickball	123 Soccer Field Ball	131 Vaulting Box	
108 Dodge Ball	116 Muscleman	124 Softball	132 Volley Ball	

ITEM 13 – LOCATION OF ACCIDENT – INDICATE BY USING ONE (1) OF THE FOLLOWING CODES:

201 All Purpose Room	207 Corridor	213 Lavatories		219 Pedestrian
202 Athletic Field	208 Grounds/Non Playground	214 Library		220 Playground
203 Auditorium, Stage	209 Gymnasium and Auxiliary Gym	215 Locker Room		221 School Bus Passenger
204 Bicycle	210 Home Arts	216 Motor Vehicle Passenger		222 Special Activities (Field Trips, Clubs, Class Trips, etc.)
205 Cafeteria	211 Industrial Education shops	217 Music and Band Room		223 Stairs
206 Classroom	212 Laboratories	218 Outdoor Education Site		224 Swimming Pool
				225 Conference Room
				226 Career Programs/ Off Campus

ITEM 14 – DESCRIPTION OF ACCIDENT – Briefly describe how the accident occurred.
ITEM 15 – WAS AN ADULT PRESENT AT SCENE OF ACCIDENT – Check Yes or No.
ITEM 16 – NAME OF INDIVIDUAL – Print the individual's full name.

SECTION B The information in this section is not intended to elicit a medical diagnosis, but is to be used for statistical purposes.

ITEM 1 – NATURE OF INJURY – Indicate using one (1) and not more than three (3) of the following codes that best describe(s) the injury(ies):

37 Abrasion/Bruise	24 Concussion	31 Foreign Body Imbedded/Loose		35 Object in Mouth/Poisoning
23 Amputation	21 Death	26 Fracture/Chipped		29 Puncture
25 Asphyxiation	28 Dental	22 Internal Injuries		36 Sprain/Strain/Pulled Muscle/ Torn Ligament
30 Bite	27 Dislocation	20 Laceration/Cuts		
32 Burns/Scalds/Chemical	33 Electrical Shock	34 Eye		

ITEM 2 – PART OF BODY – Indicate using one (1) and not more than three (3) of the following codes. If more than 3 parts of the body have been injured, indicate the most serious.

00 Ankle	60 Elbow	62 Genital Area		66 Knee		64 Shoulders/Collar Bone	
06 Arm	53 Eye	72 Hand		67 Leg		91 Stomach	
05 Back	50 Face	52 Head		68 Mouth/Lips/Tongue		73 Teeth	
90 Chest/Ribs	75 Fingers/Thumb	93 Hip		54 Neck/Throat		74 Toes	
07 Ear	71 Foot	51 Internal Organs		59 Nose		70 Wrist	

ITEM 3 – FIRST AID – Check Yes or No. If Yes is checked, indicate who gave the student First Aid (Nurse, Secretary, etc.).

ITEM 4 – SENT TO HEALTH ROOM – Check Yes or No. If Yes is checked, indicate who sent the student to the Health Room (Secretary, Teacher, etc.).

ITEM 5 – SENT TO DOCTOR – Check Yes or No. If Yes is checked, indicate who sent the student to the Doctor (Secretary, Teacher, Nurse, etc.). Print the Doctor's name.

ITEM 6 – SENT BACK TO CLASS – Check Yes or No. If Yes is checked, indicate by whom.

ITEM 7 – SENT TO HOSPITAL – Check Yes or No. If Yes is checked, indicate who sent the student to the Hospital (Nurse, Teacher, etc.). Print the Hospital's name.

ITEM 8 – WAS PARENT, GUARDIAN, OR NEIGHBOR NOTIFIED – Check Yes or No. **DATE NOTIFIED** – Indicate date per example: 06/21/71 = May 21, 1971. **HOW NOTIFIED** – By telephone, etc. **TIME NOTIFIED** – Indicate the exact time per example: 10:50 = 10 Minutes before 11 O'Clock. Check whether AM (Morning) or PM (Afternoon). **BY WHOM** – Print full name of person who notified the parent or guardian.

ITEM 9 – TOTAL NUMBER OF DAYS LOST FROM SCHOOL – Indicate per following examples:
000.5 = ½ day; 001.0 = 1 day; 100.0 = 100 days; 023.5 = 23½ days

ITEM 10 – STUDENT HAS ACCIDENT INSURANCE – Check Yes or No.

AUTHORIZATION

This form must be signed by the Principal, also indicate the date the report was signed.

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coaches must constantly participate. Everyone must be encouraged to carry an awareness and foresight of safety issues into every aspect of their lives, whether at home, in the classroom, at work, at the beach, in the mountains, or on the highway.

Professional safety awareness and foreseeability are not limited to seeing the broken glass on a playing field. Safety begins much earlier with someone picking up the unbroken glass bottle that may have been littering the field for days. It includes ensuring that there are trash receptacles in appropriate locations and that the receptacles are serviced regularly. If littering is a severe and constant problem, then there is a need to ask for cooperation from the local school and nearby commercial establishments that serve as vendors of bottled beverages. Consideration could even be given to limiting beverage sales to cans and paper cups.

Investigating the cause of problems and providing measures for the prevention of future ones are far more important steps than trying to determine whose responsibility it is to remove the broken glass from the field after the fact. The broken glass must be removed; however, the glass is only a symptom of a greater problem that needs to be solved with a long-term solution.

Support Materials

Reference publications are available to assist the concerned administrator. The National Safety Council and the Association of School Business Officials of the United States and Canada have published the *School Safety Handbook* (Haering, 1986). It provides, perhaps, more detailed information than the typical physical education and sport administrator may need on a daily basis. However, it encompasses all aspects of school safety programs. For example, a few categories of specific information of interest to the physical educator, sport administrator, teacher, and coach are:

- accident reporting/record keeping
- emergency action guides including many disasters, severe weather, lighting conditions, and evacuation plans
- physical education apparatus
- tumbling, track and field, trampoline
- eye protection
- showers
- rifle club
- football insurance
- seasonal safety

Local Safety Handbooks and Policies

Each school district should have an official collection of its school safety policies and regulations. Further, each local school should have a safety committee and specific procedures for handling its needs.

Within the overall safety plan for the district are such general categories as:

- safety education and accident prevention
- risk management
- traffic and bus safety
- fire safety
- plant and eyeglass safety
- emergency and disaster preparedness
- health
- instructional and special activities area (It is in this section that safety in physical education and athletics is generally addressed.)

Local school system handbooks generally quote school board and official institutional regulations. Some that might be of particular interest to physical educators would pertain to:

- student accident reports
- employee accident reports
- reporting student accidents
- fire safety for schools
- emergency and disaster procedures
- health care for allergic children
- emergency care of pupils subject to anaphylactic reaction to an insect sting or ingestion
- emergency first aid
- reporting and caring for an animal bite
- dogs on school grounds

Other general administrative policies and regulations of the school system to be considered in the local manual might include:

- administration of interscholastic athletic programs
- interscholastic athletics in the state (state regulations)
- extracurricular activities
- policies with regard to showering
- pupils excused from physical education classes
- student accident and football insurance
- policies with regard to equipment

- use of trampolines in physical education classes
- rifle club activities and control of rifle ranges

Appendix A at the end of this chapter demonstrates some typical elements of local safety handbooks.

Where to Start

If your school does not have a formal safety handbook, several established references exist which can be helpful in developing a schematic plan to be completed as your local situation dictates. The entire physical education and athletic staff should work together on this project in order to guarantee the best and most useful handbook possible.

The following general questions for physical education teachers and coaches should be considered in the development of the handbook:

1. Does your school district, institution, or school have an overall safety program with an assigned supervisor? Do you know who that person is?
2. Are safety policies and practices dynamic and changing as facilities, curricula, and other factors change?
3. Does your institution provide teachers with written updates, workshops, and in-service programs in the areas of general and specific safety concerns?
4. Does your local school have specific safety guidelines and a safety committee? Is a physical educator on that committee?
5. Are emergency first aid procedures known by all staff members in the school?
6. Are there regular documented inspections of all physical education and athletic facilities?
7. Is your maintenance department or system responsive to safety concerns?
8. Is documented accident reporting (for students and employees) completed in a timely fashion?
9. Are all students and employees informed about student insurance and workman's compensation policies and procedures for reporting accidents?
10. Does the school physical education and athletic administration insist that all students be properly supervised not only in the actual teaching of the activity but also in the locker room prior to and following class?
11. Are all federal, state, and local laws, codes, and ordinances followed?
12. Are the sport-related safety regulations required in the "official" rulebooks used by the school enforced? (Examples: National Operation Committee on Standards for Athletic Equipment warning labels, padded volleyball standards, starting block heights in swimming pools, etc.)

13. Does the climate in your area warrant cold or hot weather procedures to be followed for specific activities?
14. Do you know who is directly in charge of overall general safety in:
    a. your school district?
    b. your school?
    c. your physical education program?
    d. your athletic program?
15. How are injuries reported?
    a. Is a written report made?
    b. What information is included?
    c. Are reports reviewed and analyzed regularly?
    d. Are recommendations made based on the reports?
16. Has your school developed a working relationship with:
    a. local fire and rescue squads?
    b. local hospitals, clinics, and/or physicians?
17. Does your school maintain up-to-date health records on staff and students?
    a. Are records for people with special needs specially coded?
    b. Are the physical examinations filed for athletes?
    c. How does important health-related data get to physical education teachers and coaches?

Safety Checklists

Checklists are of use to teachers and coaches if they are directed to specific areas. Individual teachers and workers should add to the checklists as appropriate. The following are suggested areas of concern in the development of individual safety checklists:

- security and stability of hanging apparatus
- bleachers (indoors and outdoors)
- showers and locker areas
- floor surfaces—clean, nonslipping
- field conditions (free from rocks and glass, adequate turf)
- tennis court surfaces
- fire exits
- fire drill procedures for classes and athletic events
- general maintenance (preventive and necessary) regularly documented
- proper indoor and outdoor lighting as needed
- proper security—gym, locker rooms, outdoor facilities
- windows secure and unbroken
- proper ventilation

- appropriate safety padding
- weight training and gymnastics equipment regularly checked and repaired
- all National Operational Committee on Standards for Athletic Equipment requirements met
- all appropriate rule books from national governing agencies, such as the National Federation of State High School Associations, adhered to in the areas of safety equipment
- appropriate information given to substitute teachers not familiar with either the school, subject area, or activity being taught

Hazardous Materials

A number of federal and state ordinances have strict guidelines requiring manufacturers of any potentially caustic or toxic materials to provide the consumer with a material safety data sheet. It is most important to have this information on all materials used within the physical education and athletic areas. Some of them may be:

- swimming pool chemicals
- training room and first aid room supplies
- field paints
- mat and ball cleaning agents
- gym floor cleaners and sealers

Administrators, coaches, and teachers should be aware of all hazardous and toxic substances used. A list of these materials should be developed and a safety data sheet on each item should be requested from the manufacturer. Some state laws require that this information be maintained on file.

Posting Signs and Warning Labels

The posting of signs and decals certainly does not remove the possibility of accidents. It can, however, serve as an ever present reminder that precautions need to be taken in a particular area or activity.

Signs may be professionally produced. However, with the advent of inexpensive and creative graphics software programs for personal computers, signs can also be easily made at the local level and can be very specific to the situation. Manufacturers of some equipment are now placing warning labels on equipment and supplies. Examples of locally produced signs, manufacturers' warning labels, and commercially produced charts and labels are shown in Appendix B to this chapter.

References

Flynn, Richard B. (Ed.). (1993). *Facility planning for physical education, recreation, and athletics.* Reston, VA: American Alliance for Health, Physical Education, Recreation and Dance.

Haering, Franklin C. (1986). *School safety handbook.* Reston, VA: Association of School Business Officials in cooperation with National Safety Council.

Safety handbook. (1985). Rockville, MD: Montgomery County Public Schools.

Secondary physical education instructional guide. (1988). Rockville, MD: Montgomery County Public Schools.

Safety and legal responsibility (manual for physical activity supervisors and administrators). (1990). Canadian Intramural Recreation Association.

Appendix A

SAFETY IN PHYSICAL EDUCATION

Because of the nature of physical education class content, aspects of safety are extremely important. Teachers must *know* their responsibilities and *fulfill* them completely. Accidents can never be totally eliminated, but they and the resultant harm can be controlled significantly if teachers and administrators work together to reduce causative factors.

Discussion of the many safety measures necessary in physical education will be organized in the following categories:

Personnel

Equipment and Facilities

Class Plan and Organization

Class Activities and Conduct

Judgment

Personnel

It is essential that personnel be *trained* to teach and supervise the areas to which they are assigned; a level of competency is expected from people so trained. The following suggestions should help teachers fulfill these responsibilities. Teachers *must*:

- Be or become knowledgeable in all activities they teach so that they can ensure safe participation and anticipate any difficulties.
- Develop and enforce safety rules related to all aspects of the class or situation.
- Not leave their class unsupervised except for an emergency.
- Establish and maintain systematic locker room supervision.

Equipment and Facilities

Many injury-producing accidents occur when equipment and/or facilities are improperly made, used, and maintained. Teachers are the ultimate authority on equipment and facilities because they are present to oversee the use of these items. Teachers must:

- Ensure that maintenance and reconditioning of physical equipment are regularly completed in compliance with manufacturer's specifications.
- Require the use of appropriate protective equipment in their classes.
- Inspect facilities and equipment on a daily basis to ensure that it is in a proper, safe condition; report all hazardous conditions to the proper authorities; and recheck at a later time to assure that the condition has been fixed.

- Never leave an unsupervised gym or pool open to the public.
- Not teach in an unsafe area because if someone is injured, they may be legally liable.

Class Plans and Organization

Teachers must plan ahead for the formation and subsequent movements of their students in all phases of the class. Through careful anticipation, they can provide valuable activity time for students without compromising their safety. Teachers must:

- Always have complete, written lesson plans which they use and have readily available.
- Establish rules for safety and proper conduct.
- Keep the entire class in their vision by placing themselves in good position relative to the class organization.
- Organize the movements of all class members in a safe manner.
- Inform their principals when class size is too large to be conducted safely and when steps should be taken to reduce the number of students and relieve unsafe conditions.
- Refrain from participating in the activity with the class because the level of supervision is reduced and overmatching in size or talent may occur.
- Plan an inclement weather/disrupted activity schedule which should closely follow the activity unit currently being taught.

Class Activities and Conduct

In addition to the supervision that trained physical educators bring to a class, they also must choose proper activity content and give proper, safe instruction. They should be cautious about forcing students to perform any activity or skill which has some inherent danger. It is sometimes difficult to tell if a student is afraid of performing a skill or is simply trying to "get out of something." It is normally safer for the teacher to refrain from forcing since there is little recourse if the student is injured when doing such an activity. Teachers must:

- Teach skills within the conditioning and ability levels of the student.
- Teach skills in a logical progression and assure that no student moves on to a more difficult one before reaching an adequate level of execution in preceding skills.
- Assure equal competition within the class situation, e.g., students of similar speed and ability should be matched in small games, and students of similar weight and height should be together to practice wrestling holds

Judgment

"Think before you act" is a very important phrase for physical educators to remember. The ability to anticipate is enhanced by knowledge of the subject and experience in the teaching/

leading role. Acting as a "reasonably prudent person" is the expectation held for physical educators. Teachers must:

- Know and follow approved methods of first aid and ways of handling injuries as well as reporting and following up on accidents and injuries
- Teach only those activities listed in the instructional guide or those approved by the coordinators of secondary physical education and athletics
- Anticipate that inappropriate behavior can lead to unsafe situations and stop such behavior immediately
- Foresee those situations within class activities which could lead to unsafe movement, e.g., know gymnastic skills and the ability levels of the students to anticipate the need for spotters

While some risks are inherent in certain situations, teachers must minimize the level of risk and anticipate possibilities.

Appendix B

POSTING SIGNS AND WARNING LABELS

DANGER
Keep Hands / limbs clear of weights and moving parts
DANGER
Check for frayed cables and replace at once
DANGER
Never add additional weights

DO NOT SIT
OR
STAND
ON BLEACHERS
WHEN THEY ARE
CLOSED

DANGER
Keep head clear of weights and moving parts
DANGER
Proper foot-wear and positioning required
DANGER
Insert selector pin fully and lock in place

WARNING

Lacrosse is a contact sport played with sticks and a hard ball moving at high speed. This means you can be injured while playing the sport. To reduce the risk of injury, you must exercise common sense and obey the rules at all times. For example, do not use this helmet to butt, ram or spear another player. This can severely injure you.

Even when you play lacrosse according to the rules, you expose yourself to serious injury. THIS HELMET WILL NOT PROTECT YOU AGAINST ALL INJURIES; AMONG OTHERS, NECK, HEAD AND TEETH INJURIES.

Alteration of this helmet can increase your chances of injury. This helmet should not be worn if cracked or otherwise damaged. Use this helmet for FIELD LACROSSE ONLY. NO HELMET CAN PREVENT ALL INJURIES.

YOU USE THIS HELMET AT YOUR OWN RISK.

WARNING

Do not strike an opponent with any part of this helmet or face mask. This is a violation of football rules and may cause you to suffer severe brain or neck injury, including paralysis or death.

Severe brain or neck injury may also occur accidentally while playing football.

NO HELMET CAN PREVENT ALL SUCH INJURIES. YOU USE THIS HELMET AT YOUR OWN RISK.

BEST COPY AVAILABLE

USE OF THIS EQUIPMENT IS RESTRICTED TO STUDENTS ACCOMPANIED BY A TEACHER.

THIS LOCKER ROOM IS FOR THE USE OF PHYSICAL EDUCATION STUDENTS AND TEAM MEMBERS DURING THEIR ASSIGNED PERIODS EXCLUSIVELY.

INSTRUCTIONS
1. Clean surface with an alcohol treated pad.
2. When surface is dry, peel appropriate label, & place in position.
3. Rub vigorously so adhesive will have proper hold.

Available From:

Atlantic Fitness Products

8701 Mariova Park Drive, Suite 102, 21237

301-488-2020 • 800-445-1855

URGENT

BEFORE USING:

1) Have complete physical

2) Get qualified instruction

3) Inspect nuts & bolts tighten if loose

4) Inspect cables, connections & pivot points. Replace as necessary

5) Use only as intended to be used

6) Never attempt to loosen jammed cables or weights alone; get assistance

4

First Aid and Sport Safety Policies

Phil Hossler
East Brunswick High School
East Brunswick, New Jersey

This chapter focuses on safety in the athletics program and is addressed especially to those with coaching responsibilities. While this person may also have teaching responsibilities, the terms "coach"and "athletics" are used throughout the chapter. This does not imply that the recommendations and guidelines are not equally useful for teachers.

Developing Your Emergency Medical System

The field of first aid in sports is a vast one that encompasses many general and specific concerns. This section deals with the basic administrative and procedural concerns in the implementation of an emergency care plan and the prevention of injuries.

There is no other field where the adage "an ounce of prevention is worth a pound of cure" carries greater weight than in medicine. The health care afforded athletic teams has become a concern as much of the legal profession as the medical. The provision of adequate, systematically reviewed and continually updated health care for athletes is clearly an area where physical education and athletic departments must do their homework.

An effective sports medicine program educates coaches, athletes, and parents to the relevance of proper training, prevention and handling of athletic injuries, and the benefit of establishing a system to handle injuries when they occur.

An injury may occur at any time and in any location. No sport is immune from injury occurrence 100 percent of the time. Steps can be taken, however, to prevent injuries from occurring and to deal with any injuries that may occur.

The extent to which society views an event as serious and unexpected determines whether it will call that event an accident. What one group calls an accident may not be regarded as such by another group. Being injured, therefore, may be different from being in an accident. The difference is based on causal factors in the setting, possibilities for prevention, and the seriousness of the harm.

Reasonable and prudent forethought will enable the physical education and athletic department to produce a predetermined master plan for dealing with the possibility of injury. The following items should be addressed in an emergency medical system (EMS) plan:

- Proper supervision of activities
- Adequate medical preparation and supplies
- Adequate training in injury recognition and first aid treatment by the entire staff
- Frequent appraisal of facilities and equipment.

Supervision of Activities

The best method of handling injuries in athletics is to anticipate and prevent their occurrence. Supervision must be more than just a visual surveillance of the activity. It involves vocal clues to hazardous situations and appropriate corrections. Athletes should be reminded of actions which produce potential hazards to themselves and others.

Prior to any new activity or skill, the coach should indicate the desired objectives as well as the possible detrimental results and dangerous behavior inherent in the activity. It cannot simply be assumed that any person who is introducing, conducting, or even merely overseeing an athletic activity is knowledgeable in that area. Coaches should make certain that they study not only their "game plan for success" but also the possibility of a "lame plan for injury."

There is no substitute for experience. Coaches who have been involved in the sport for years have learned how to anticipate and prevent injuries. The "volunteer" or "walk on" coach is not as experienced and may fall prey to enthusiastic short vision.

Supervision Guidelines

- **Don't leave the site** where the activity is being conducted. Rapid response to severe bleeding head injuries may make the difference between life and death.
- **Do be in a position to supervise**. This may require some adjustments in practice routines and assignments.
- **Do anticipate problems**. As professionals, coaches are expected to identify potential hazards and take precautions against them. Included are such items as defective equipment (bats with slippery grips, cracked helmets, slippery running surfaces), lack of preventive safety measures (water on the gym floor, improperly secured nets, debris on the playing field), poorly fitted or defective equipment and clothing, or activities which are inappropriate for the capabilities or conditioning level of the participants.
- **Don't permit horseplay**. Innocent fooling around often results in needless injury.
- **Don't knowingly permit rules, regulations, or safety procedures to be violated**.

Medical Preparation and Supplies

The following criteria may be used to determine the degree of thoroughness shown in anticipation of both life threatening and non-life-threatening situations. This list is not complete in all aspects of possible situations, but it is a guideline for the development of a checklist specific to the individual school.

- Employ an athletic trainer certified by the National Athletic Trainers Association. A certified athletic trainer can not only provide quality injury care, but can also provide for better evaluation and disposition of injured athletes. The trainer can provide varying amounts of in-house treatment and physical rehabilitation under the direction of a physician, depending upon individual state regulations.
- All injuries should be properly and promptly recorded. In the absence of an athletic trainer, the coach must record the details of the injury and report them to the proper authority. This will greatly help the attending physician as well as avoid entanglements and delays with insurance companies.
- It is desirable to use a system of communication by which teams practicing anywhere on and off school grounds are able to communicate with the proper person. Walkie-talkies may be carried in each team's first aid kit and a base station kept in the training room, nurse's office, or main office. The time saved may be crucial in the event of serious injury.

First Aid Kits

Provide each team with a first aid kit. Include a separate kit for varsity, junior varsity, and freshmen teams. These kits must be periodically checked and supplies replaced as needed.

Place in each team's first aid kit a list of those team members who have allergies, special conditions, or other noteworthy medical conditions. This information can be obtained from the athlete's medical history form or from the nurse's office.

Make certain that each athlete and manager has completed an emergency contact card (see Figure 1). These cards must be in the first aid kit which should always be on the field during both practices and games.

Provide each member of the coaching staff and place in each first aid kit a card containing important emergency telephone numbers such as police, first aid squad, team doctor, and hospital.

The following items should be included in all first aid kits:

adhesive tape
tape adherent
underwrap
ace bandages (4-inch is the most versatile size)
band-aids
extra large band-aids
lubricant (e.g., vaseline)
analgesic cream (heat cream)
tongue depressors
pieces of foam rubber with varying thicknesses
triangular bandage
emergency contact cards for all athletes and managers
list of team members with special medical conditions
money for pay phones
paper and pencil

Ice and Water

The use of ice in first aid is of the utmost importance. Every athletic team must have the capability of carrying ice in some form to all games, both home and away, and to practices. Every school should have enough ice for first aid for all teams as well as ice for the team's drinking purposes.

Even a minor injury, if allowed to go unattended, may delay the athlete's return to activity. The application of a cold modality is accepted as essential initial first aid for virtually every athletic injury; failure to provide this could be

EMERGENCY CONTACT CARD

NAME _____ DATE OF BIRTH _____

Last First

PARENT NAME _____ PHONE _____

Mother At home At work

_____ PHONE _____

Father At home At work

If parent cannot be reached, indicate someone responsible for your child

NAME _____ PHONE _____

FAMILY PHYSICIAN _____ PHONE _____

INSURANCE COMPANY _____ POLICY NUMBER _____

KNOWN ALLERGIES TO MEDICATIONS _____

Figure 1. Sample emergency contact card

deemed negligent. The techniques for the use of ice (15-30 minutes on, 30-60 minutes off) should be known by all coaches, athletes, and parents.

It is essential to provide water for those teams practicing indoors as well as outdoors. Heat related disorders may be precipitated in a poorly ventilated, humid gymnasium or wrestling room just as easily as outdoors in the heat of August.

Coaches' Preparations

Most coaches have had minor injuries occur to their athletes. Most of these injuries are easily handled by either the coach or the athletic trainer. But what about that one time when someone walks into the swinging bat of a teammate, or when the athlete steps in a hole and cannot bear any weight of the ankle, or when the athlete's shoulder may actually be fractured or dislocated? What forethought was given to communications, transportation, parents, first aid squad, and removal of the athlete from the field? What preparations were made for the occasion when the life of the athlete may actually be endangered?

Each athletic department must take steps to ensure that adequate prior preparation was taken to handle both minor and major injuries. Measures include providing all staff members with in-service opportunities to obtain and/or renew basic first aid and CPR certification. Organized programs which

demonstrate concern and attempts to remain current in knowledge are the best defense against needless injury as well as needless lawsuits.

Project the attitude that hazardous situations should be reported and that steps will be taken to eliminate them as quickly as possible. Poor equipment and hazardous fields must be remedied before an injury can occur.

Situation Quiz

Consider the following injury situation and decide which reaction your school is closer to.

Your baseball team is practicing about ¼ mile from the school. One of the students hits the ball and releases the bat by throwing it over his shoulder. You've warned the team against this practice, but it happened anyway. The bat strikes the next batter across the bridge of the nose. The athlete immediately falls to the ground bleeding profusely from the nose and upper lip. When you reach him he is conscious but in great pain. What do you do?

Situation #1—Surprised Reaction!

1. Try to stop the bleeding with the palm of your hand.
2. Send a player up to the building get the athletic trainer or nurse.
3. Hope the athlete doesn't need CPR, because you missed the course the last three times it was offered.
4. Try to remember if the nurse or trainer has a cart that can be used to get to the field.
5. Hope the messenger you sent knew that you really think the trainer should call for an ambulance, and pray the messenger can be relied upon to accurately convey the details.
6. Keep looking at your watch (now covered with blood), and wonder what is taking everyone so long?

Situation #2—Planned Reaction!

1. Pull several sterile gauze pads out of the first aid kit the athletic trainer requires at all practices.
2. Hold the pads in place while you call the athletic trainer with the walkie-talkie from the first aid kit.
3. Tell the trainer that, while the athlete is in a great deal of pain, he is conscious and responsive.
4. Place one of the ice bags you have at practice directly onto the gauze pads and position the athlete in the shock position.

5. Wait for the trainer to arrive, knowing that it will only take minutes in the athletic department's golf cart.
6. Help while the trainer determines possible severity and returns with the athlete to the building to call the boy's parents to pick him up at school.
7. Stop worrying, because you know that the athletic trainer will provide the athlete's parents with information about head injuries and complete the injury report.

Which of the two reactions would make the parents feel better about the care afforded their son? Which of the two reactions would stand up better in a court of law?

Since it is impossible to know beforehand which incidents will be routine and which will be life threatening, it is vital that preparations be made to ensure the highest degree and greatest amount of quality care in all situations.

Summary

During any athletic activity there is the possibility of injury. It is the responsibility of those persons charged with governing and implementing the activity to prevent injuries through:

- Proper conditioning
- Observation of rules
- Proper use of equipment
- Elimination of hazardous practices and situations.

Coaches have the responsibility of knowing what to do when an injury occurs. This does not imply that everyone involved in the activity must know how to evaluate all athletic injuries, but it does mean that everyone involved should know basic first aid, CPR, and how to activate the emergency medical system.

All activity injuries, regardless of severity, are best handled by preventing their occurrence. Prevention requires forethought and planning. The emergency medical system must take into consideration the respective first aid training and competencies of those persons working within it. Communication and transportation limitations must be considered and steps made to correct areas of weakness.

5

Aerobic Fitness Programs

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In the late 1960s Kenneth Cooper popularized the term "aerobic exercise" with a series of best-selling books that emphasized the health benefits of regular participation in sustained, moderate intensity physical activity. Over the ensuing three decades many millions of Americans have become participants in exercise programs that are designed to develop aerobic fitness and provide the associated health benefits. During the same period exercise scientists have aggressively pursued an understanding of the optimal ways in which to use exercise as a health promotion and disease prevention modality.

This chapter is intended to summarize the relevant research findings of the past 25 years. It describes accepted professional standards for safe delivery of aerobic exercise programs.

Specifically, this chapter shall: (1) summarize the purposes and principles of aerobic fitness programming; (2) discuss the risks associated with participation in aerobic exercise; and (3) describe accepted procedures for reduction of the risks of aerobic exercise. Since the primary target audience for this chapter is professionals who work with young people, emphasis will be given to guidelines that are most applicable to children, youth, and young adults.

Purposes and Principles of Aerobic Fitness Programs

Purposes

Aerobic fitness programs have two overriding purposes. First, most persons who engage in aerobic exercise on a regular basis do so with the expectation that they will benefit their health by reducing their risk of developing chronic diseases. Second, participants in aerobic exercise programs expect to experience an improvement in functional capacity (i.e., physical fitness). An enormous body of research evidence, accumulated over the past three decades, indicates that these two aims are realistic.

It is now well established that regular participation in aerobic exercise during adulthood is associated with reduced risk for future development of coronary artery disease, hypertension, and certain cancers (5,6,23,25). This epidemiological evidence is supported by a large body of physiological studies that document plausible biological mechanisms by which exercise could reduce chronic disease risk (9,20,29,32).

Over the past 20 years the scientific support for the health benefits of exercise has been widely disseminated to the public as well as to health professionals. As a result, the public has come to accept the contention that regular exercise is a key component of a "healthy lifestyle." Because participants in aerobic fitness programs typically report the anticipated health benefits to be a major reason for their participation, it is critical that programs be conducted in such way as to deliver these benefits.

That regular aerobic exercise produces an improvement in cardiorespiratory fitness may be seen by some as so obvious as to preclude further discussion of the point. In fact the relationship between physical activity behavior and physical fitness is complex and not fully understood. The relationship between activity behavior and fitness is complicated by the fact that an individual's genetic endowment has a profound effect on both fitness and physiological adaptation to exercise (8). Nonetheless, there is compelling evidence that exercise training can produce improved fitness (20,22). Improved physical fitness and the various anatomic and physiological changes that accompany it are attractive outcomes for beginning exercisers and are frequently cited as reasons for initiation of an exercise program.

Principles

The burgeoning body of knowledge on the health and fitness benefits of aerobic exercise has given rise to a set of widely accepted guidelines for the conduct of aerobic fitness programs. A full discussion of these guidelines is beyond the scope of this chapter, but is available in a number of other excellent sources

(2,3,12,15,28). Briefly, it is generally recommended that adults exercise for 30 or more minutes, three or more days per week, at an intensity corresponding to 40% or more of individual maximal aerobic power. Numerous specific modes of exercise can be used to meet these criteria, and among those used by many persons are walking, jogging, swimming, cycling, aerobic dance, and racket sports. Traditionally, many in the public have had the impression that only the more vigorous forms of exercise produce important benefits to health and fitness. However, recent research findings indicate that moderate exercise, if engaged in regularly, provides very important health benefits (5,13). An added benefit to the more moderate approaches to exercise (e.g., walking, gardening) is that, for many, this type of physical activity is much more attractive and feasible than vigorous activities like running and aerobic dance.

Goal

Clearly, the expectation of most regular exercisers is that they will experience gains in fitness and reductions in disease risk. Therefore, the goal of aerobic fitness programs should be to deliver these benefits. However, it is known that participation in exercise does involve risk. Some forms of exercise carry risk of musculoskeletal injury. In some persons, exercise may involve increased risk for development of certain illnesses or may tend to aggravate existing disease states. Because regular participation in exercise can promote health and fitness, but also increase risk of injury and illness, leaders of exercise programs should strive to strike a positive balance between the expected benefits and potential risks of exercise. The overriding goal should be to maximize the benefits of exercise while minimizing the risks.

Orthopedic Injuries

Because exercise involves movement it carries with it a risk of injury to the musculoskeletal system. Two general categories of musculoskeletal injuries are common in exercise participants. *Traumatic injuries* can occur when a very high level of force is applied to muscle, bone, or joint tissue. Often those injuries result from accidents such as falls, collisions with another participant, or collisions with an object or implement. In contrast, *overuse injuries* result from chronic performance of movements that apply moderate levels of force to body tissues. Such repetitive movements can cause irritation of muscle, bone, and/or joint tissues. Often, these overuse injuries arise when an individual abruptly increases the amount of exercise performed or changes the conditions in which the exercise takes place (e.g., different equipment, different terrain).

A large number of different traumatic and overuse injuries can occur in exercise participants, and a discussion of each of these is beyond the scope of this chapter. Many of these injuries are specific to certain modes of exercise (e.g., "tennis elbow," "swimmer's shoulder"). In this chapter we shall be limited to a discussion of the general risk factors for exercise injuries. More specific and detailed discussions of this issue are available elsewhere (e.g., 5,16).

Risk Factors

Many risk factors have been associated with musculoskeletal injuries during participation in aerobic activities. These can be placed in three categories: environmental factors, exercise program factors, and personal participant factors. Environmental factors include those related to the physical situation in which the activity is performed. Program factors are those pertaining to the type, intensity, frequency, and duration of the exercise performed. Participant factors include those related to individual status in areas such as fitness, skill, body size, developmental stature, and injury history. Table 1 provides a listing of some specific injury risk factors in each of these three categories.

The risk of developing a musculoskeletal injury as a result of participation is aerobic activity can be reduced by carefully attending to the various risk factors. Following are some specific guidelines that should be followed to reduce injury risk during participation in aerobic exercise.

Environmental Factors

An indoor facility should be large enough to accommodate the number of participants, should not include loose or unsecured equipment, and should be well lighted. The flooring should provide for shock absorption (concrete is not preferred), should be smooth but not slippery, and must be kept clean. Outdoor activities should be performed in a space that is well lighted and that presents an even surface. Bicyclists, walkers, and joggers should avoid streets that have heavy vehicular traffic and should rigorously obey traffic laws.

Program Factors

From the perspective of reducing injury risk, the best advice to aerobic exercisers is "start easy and progress gradually." Beginning exercisers should employ modest frequencies, intensities, and durations of exercise. For example, for many persons 15-20 minutes of aerobic exercise at an intensity of 50-70% of maximal aerobic power every other day is a level of activity that minimizes injury risk. Gradual increase in the training dose should be applied over a

Table 1
Risk factors for musculoskeletal injury during aerobic exercise.

Environmental Risk Factors
Facility is too small
Poor lighting
Space is cluttered with loose objects
Heavy vehicular traffic
Surface is too hard or too soft
Exercise Program Risk Factors
Inclusion of improper exercises and movements
Excessive dose of exercise
Too rapid increase in dose of exercise
Shoes that are poorly designed, poorly fitted, or worn out
Equipment that is of the wrong size or weight
Personal Participant Risk Factors
History of injury
Improper developmental level
Lack of motor skill
Low fitness

period of weeks (or months) until the desired level of activity is attained. Also, it is important that the individual use exercise equipment that is the proper size and style. Properly designed and fitted shoes are essential for persons engaged in weight-bearing activities like walking, jogging, and aerobic dance. Likewise, other equipment (e.g., rackets, bicycles) should be of the proper weight and size for the individual participant.

Personal Participant Factors

Risk of injury can be reduced by carefully modifying the exercise program in accordance with the characteristics of the individual participant. Participants who have a history of injury with a particular activity are well advised to either use that activity with moderation or select another activity. For example, an aerobic dancer who has experienced chronic injury with high impact aerobic dance should switch either to low impact aerobic dance or to another activity

like cycling. In youngsters, developmental status is an important consideration. Those who are still growing are advised to avoid very high levels of training in weight-bearing activities like running because of possible injury to the growth plates in the skeleton. Also, regardless of age or developmental states, motor skill level should be brought to an adequate level before an activity is used for aerobic training. For example, among tennis players injury risk is lower in those who have better stroke mechanics.

Cardiovascular Incidents

The risk of cardiovascular complications (i.e., cardiac dysrhythmia, myocardial infarction, sudden death) during vigorous exercise has long been a subject of controversy. Unfortunately, misinterpretation of the available data may unjustifiably deter some people from exercise participation. Because of the increased demand placed on the cardiovascular system, risk of cardiac arrest and sudden death does increase during vigorous exercise (27,30); however, the risk is transient and deaths are rare, occurring at a rate of approximately one per year in 15,000–20,000 adult exercisers (2).

A number of factors increase risk during exercise, particularly increasing age, higher intensity exercise, and the presence of heart disease. Most exercise-related sudden deaths occur in individuals with heart disease, typically atherosclerotic coronary artery disease in older men and congenital heart disease in younger persons (under 35 years of age), not in healthy persons. Older individuals are at greater risk for complications because the possibility of underlying heart disease increases with advancing age (3).

It must be emphasized that although risk is increased during the exercise bout, the overall risk of dying is less in more physically active and physically fit persons when compared to their sedentary counterparts (5,21,23). Research consistently supports the protective effect of regular physical activity, including leisure-time activity, against the development and progression of various chronic diseases. In other words, the health benefits derived from regular physical activity significantly outweigh the risks.

Risk Reduction

It is important to realize that despite the health benefits provided by regular physical activity, in certain individuals the risks of exercise testing and training may outweigh the benefits and may actually aggravate the existing disease state. Consequently, exercise should be administered cautiously or avoided under these conditions. These special cases introduce a challenge for the health professional that is twofold: (1) they must be aware of the various disease

states that exercise may aggravate and (2) proper precautions must be taken to minimize risks and maximize benefits associated with exercise.

Although it would be ideal for everyone to undergo a medical evaluation and exercise test prior to beginning an exercise program, this is not a realistic recommendation and simple screening methods alone can vastly improve the safety of exercise. A more practical approach is to consider the age, health status, and type of exercise program desired, and then carefully evaluate individuals prior to participation. The Physical Activity Readiness Questionnaire (PAR-Q) is commonly used as a screening tool (14). Pre-participation screening may help identify individuals who require further evaluation and, subsequently, enhances the safety of exercise.

The American College of Sports Medicine (2) has established exercise testing and prescription guidelines for apparently healthy, higher risk, and diseased individuals that differentiate moderate-intensity exercise (40–60% VO_{2max}) from vigorous (> 60% VO_{2max}) exercise. Because the risk of moderate exercise is low, ACSM recommends that most persons, except those with known disease, may begin this type of exercise program without undergoing a medical evaluation or exercise test. Persons with known disease or symptomatic, higher risk (defined by ACSM) individuals are advised to undergo a medical evaluation and exercise test prior to participation. The guidelines for vigorous exercise participation differ slightly. Apparently healthy males (less than 40 years of age) and females (less than 50 years of age) may begin a vigorous exercise program without a medical evaluation or exercise test, whereas all others are advised to undergo a medical evaluation and exercise test.

Existing Disease States

Prescribing exercise for individuals with disease is more complicated than for healthy individuals. Careful screening of individuals with disease prior to beginning an exercise program and knowledge of potential risks during exercise are essential to increase the safety of exercise. Fortunately, guidelines to enhance safety of exercise testing and prescription of diseased populations are available (1,2,3,15).

Cardiovascular Disease

Because most exercise-related deaths are attributed to underlying heart disease, individuals with known heart disease are at higher risk for cardiac complications during exercise. Death is still rare, however, particularly when exercising in medically supervised programs. Sudden cardiac arrest in individuals with coronary artery disease has been estimated to be 1 in 80,000 to

160,000 person-hours (10). Fatalities have been estimated at one per 783,972 patient-hours of exercise in supervised outpatient cardiac rehabilitation programs (31).

Risk reduction. Clinical status, type of activity, intensity of activity, and extent of medical monitoring impact the safety of exercise in patients with cardiovascular disease. Unstable cardiovascular disease (i.e., unstable angina and high-grade dysrhythmia, uncompensated heart failure, acute systemic infections, endocarditis, pericarditis) and a variety of other conditions preclude exercise participation until the patient becomes stable. Guidelines have been developed to help identify individuals who may undergo exercise testing and subsequent exercise program participation and the conditions that contraindicate exercise (1,2,3).

Stratifying cardiac patients according to risk of experiencing cardiac complications into low, moderate, or high risk categories is important in order to properly assess prognosis and subsequently prescribe appropriate exercise. The American College of Sports Medicine (2) and the American Association of Cardiovascular and Pulmonary Rehabilitation (1) have developed guidelines to aid in this process. Exercise testing also minimizes the risk of exercising an individual with heart disease and is highly recommended in this population prior to prescribing exercise. Exercise testing assesses functional capacity and safety of exercise, aids in risk stratification, and enables accurate and safe target heart rate determinations.

Low-level activities, such as walking in monitored settings, offer the least risk, whereas vigorous exercise, such as jogging, increases the risk for cardiovascular complications. A high percentage of complications occur during the warm-up and cool-down phases of exercise and, therefore, inclusion of these components and proper instructions are critical to the exercise prescription. Exercise should always be prescribed on an individual basis and should start slowly and progress gradually. Signs and symptoms should be monitored closely during exercise. Changes in medications or medical status may necessitate adjustment of the prescription or termination/suspension of the exercise.

Diabetes

Diabetes mellitus is a metabolic disease in which the body does not produce or adequately utilize insulin, a hormone involved in controlling blood glucose, typically resulting in high blood glucose levels (hyperglycemia). The two types of diabetes mellitus are insulin-dependent or Type I diabetes, and non-insulin-dependent or Type II diabetes. Potentially serious complications in the diabetic include vascular problems, heart disease and stroke, blindness, kidney disease, and a variety of neuropathies that may complicate exercise prescription.

There are potential risks associated with exercise for diabetics, particularly insulin-dependent diabetics. Under certain conditions, exercise may worsen the metabolic state. If exercise is performed with too little insulin present, characterized by an exceedingly high blood glucose level (> 300 mg/dl), hyperglycemia will increase further and ketosis may develop. Alternatively, a more common situation occurs if too much insulin is present prior to exercise or proper precautions are not taken. Under these conditions, blood glucose will decrease further and hypoglycemia may result, either during exercise or several hours later. Other potential problems for exercising diabetics include complication from retinopathy and foot injuries (2,15,28).

Risk reduction. Regular exercise plays a key role in the management of diabetes by providing cardiovascular, health, and psychological benefits and possibly improving glycemic control. Exercise testing and a thorough medical evaluation are recommended prior to engaging in a strenuous exercise program primarily because diabetics are at increased risk for developing cardiovascular disease, particularly if over age 35 or if risk factors are present. Exercise prescription in diabetics is similar to healthy individuals; however, because many factors affect the metabolic response to exercise, such as time and site of insulin injection, time of last meal, and exercise intensity, individualization is necessary to ensure safety.

Several recommendations that may augment the safety of exercise include: monitor blood glucose frequently to help adjust diet and insulin dosage; do not exercise if blood glucose is above 300 mg/dl; increase carbohydrate intake according to the type and duration of exercise performed to help avoid hypoglycemia; inject insulin in an area not active during exercise, such as the abdomen; avoid exercising during insulin's peak action; and promote exercising with a partner. It is very important for diabetics to wear proper footwear and practice good foot hygiene because of the potential for infections and circulatory problems. Diabetics with retinopathy should avoid strenuous, high-impact exercise. It is also important for the Type I diabetic to establish a regular, daily pattern of diet and exercise to optimize glycemic control (2,15).

Hypertension

Persons with chronic hypertension (140/90 = borderline; 160/100 = moderate to severe) are at increased risk for stroke and coronary artery disease (2). Unfortunately, many individuals with hypertension are unaware of the condition or are noncompliant with treatment. If untreated, hypertension may eventually lead to irreparable organ damage.

Limited information is available addressing the potential deleterious effects of acute exercise on hypertension. Elevated baseline blood pressure increases the chances of marked increases in blood pressure during exercise,

principally systolic, possibly increasing the acute risk of cerebrocardiovascular disorders (28). High-intensity exercise and significant isometric exercise result in higher blood pressure elevations than lower intensity, dynamic exercise and may be contraindicated in hypertensive individuals.

Risk reduction. Regular exercise may help prevent hypertension (6) and may lower blood pressure in some moderately hypertensive individuals (9). Low-intensity exercise appears to be as beneficial, if not more beneficial, in lowering blood pressure as high-intensity exercise. In fact, high-intensity or significant isometric exercises are generally discouraged in hypertension because of the marked blood pressure elevations that accompany these exercises. Hypertensive individuals interested in resistance training are advised to perform low-resistance, high-repetition exercises. A variety of medications are prescribed in the treatment of hypertension with varying effects on heart rate and blood pressure. These effects and other potential problems arising from the medications, such as hypokalemia from certain diuretics, need to be understood prior to prescribing exercise. Changes in medications may necessitate changes in exercise prescription, especially if heart rate is used to monitor intensity. In some cases, intensity may need to be monitored by methods other than heart rate, such as rating of perceived exertion (RPE) scales (7).

Exercise-induced Asthma

Asthma triggered by exercise has been termed exercise-induced asthma and is particularly common in younger people. Symptoms include shortness of breath, wheezing, coughing, and dyspnea. Various environmental and exercise conditions may exacerbate the asthmatic response. Cold, dry air, atmospheric pollutants, and higher intensity exercise (85% VO_{2max}), lasting for at least 5–8 minutes, appear to precipitate bronchospasm in these individuals. Running is the exercise most likely to elicit a response and swimming the least likely (12,18).

Risk reduction. Exercise need not be avoided in this population. In fact, many great athletes, including Olympic athletes, suffer from exercise-induced asthma. A number of factors can reduce the risk of experiencing problems during exercise. A prolonged warm-up is recommended to decrease onset of symptoms. Additionally, if the participant learns which exercise intensities provoke the bronchoconstriction, these intensities may be avoided.

The type of exercises least likely to provoke bronchospasm are swimming and intermittent activities, such as weight lifting. Exercises such as walking or aerobic dance can be performed successfully if a gradual warm-up is included and the intensity remains low.

Other recommendations include avoiding cold, dry climates, or wearing a face mask or bandanna over the mouth to humidify and warm the air. Breath-

ing through the nose rather than mouth has been demonstrated to prevent exercise-induced asthma, and often times slower and deeper breathing counters the effects of bronchospasm. Exercising in nonpolluted air also helps reduce symptoms. Medications can be prescribed to control asthmatic episodes for those who wish to participate in activities that are likely to provoke bronchospasm. Because a refractory period appears to follow exercise, time between exercise bouts may need to be considered. Repeating the same exercise at intervals of one hour or less may elicit a lesser asthmatic response. Conversely,long breaks between bouts restores the abnormal responsiveness (12,18).

Other Considerations

A variety of other disease states and health conditions warrant careful exercise prescription to reduce the cardiovascular risks associated with exercise. These "special populations" include patients with renal disease, pulmonary disease, peripheral vascular disease, and arthritis. Other special populations include obese individuals, the elderly, children, and pregnant women.

The growing number of exercisers in these special populations emphasizes the need for careful screening of individuals prior to beginning an exercise program and has prompted the development of exercise guidelines for these individuals (2,15,28). Although proper assessment and prescription should allow most individuals to participate in physical activity, it is important to realize that there are contraindications to exercise. Under certain circumstances, the exercise prescription may require modification or termination if there is a change in medical status (e.g., flare-up of arthritis, increasing pain) or a progressively worsening course. Health personnel must recognize these conditions and must be knowledgeable about different health states in order to augment safe exercise prescription.

Heat Illness and Frostbite

Some aerobic activities are often performed in extreme environmental conditions. High levels of environmental heat stress increase the risk of heat illnesses such as heat exhaustion and heat stroke. Prolonged, aerobic exercise results in the production of large amounts of metabolic heat and this heat must be dissipated to the environment. If the temperature and/or relative humidity are high, heat dissipation from the body is impaired and heat illness can result. Heat stroke, the most severe of the heat illnesses, is a potentially fatal condition in which the body's temperature rises to extreme levels. The risk of heat illness can be reduced by taking several precautions. During par-

ticularly warm and humid periods, aerobic exercise should be performed in the cooler times of day or in an air-conditioned environment. Minimal clothing should be worn and fluid should be replaced by drinking copious amounts of water or a commercially available sports drink. The body's capacity for cooling itself improves with repeated exposures to exercise in the heat; therefore, this "acclimatization effect" should be induced before performing vigorous activity in heat stress conditions. Fortunately, heat acclimatization can be induced with moderate bouts of aerobic exercise in the heat for only 5–7 days.

Extreme cold can also carry risk for the aerobic exerciser. The major concern is frostbite, which can develop if body tissues are exposed to extreme cold for prolonged periods. Particularly vulnerable are the toes, finger, ears, and facial tissues. The risk of frostbite can be reduced by carefully covering these vulnerable tissues with appropriately designed clothing, avoiding the most extreme conditions, and decreasing the exercise time when conditions are particularly cold and windy.

Activity-Specific Recommendations

Cycling

Stationary cycling provides continuous, large muscle exercise and has become an attractive alternative for individuals with orthopedic problems, busy schedules, and limited physical space to exercise. Some stationary cycles incorporate arm movements, providing an option for more whole-body exercise and an alternative mode for persons unable to perform leg exercise.

Some individuals prefer outdoor bicycling as an exercise mode. A common problem faced by outdoor cyclists is finding safe areas to cycle and areas that provide opportunities for continuous cycling (i.e., away from traffic and stoplights). Additionally, because outdoor bicycling is potentially more dangerous than indoor stationary cycling, knowledge of safety rules and equipment is necessary.

Aerobic Dance

Aerobic dance has become a popular mode of exercise that provides a fun-filled cardiovascular exercise alternative. The high injury rate of high-impact aerobics (e.g., shin splints, stress fractures) has led to the development of low-impact aerobics, which replaces the repetitive jumping movements with no-bounce movement and more upper body activities. The intensity of low-impact aerobic dance can be increased by faster movements and more arm movements. The addition of hand and wrist weights may also increase the inten-

sity. The use of ankle weights has been discouraged because of the potential increased risk of injury (19). Step aerobics, another popular new innovation, incorporates stepping on and off benches of varying heights and is less stressful than high-impact aerobics. Proper footwear, slow progression, and proper technique are suggested to decrease the risk of injury. Individuals embarking on an aerobic dance regimen should gradually progress to more intense forms of aerobic dance.

Stair Stepping

Another popular form of aerobic exercise is performed on stair stepping machines and has been shown to be an effective exercise alternative (17). Gradual progression, as with all exercises, is advised because rapid rises in heart rate may lead to overexertion. Because certain knee injuries may be aggravated by stair stepping, it is recommended that individuals with knee injuries strengthen legs prior to beginning a stair stepping program (11).

Running/Jogging

Running is a weight-bearing activity in which the foot contacts the ground with a force equal to three times the body weight or more. It is not surprising then that running is associated with a relatively high incidence of injuries to the lower extremities. Particularly common are overuse injuries to the knee, foot, and lower leg.

Studies of musculoskeletal injuries in habitual runners have examined a large number of possible risk factors. Those factors that seem most clearly associated with incidence of injury are running mileage and personal history of injury. Those who run more miles per week and/or participate in longer running events (e.g., marathons) are more likely to experience injury than are those who run shorter distances. Runners who have been impaired previously are more likely to be impaired in the future than are runners who have been injury free in the past.

Among runners and joggers, risk of injury can be reduced by running modest distances (e.g., 15–20 miles per week or less). This is particularly important in persons who have been injured in the past. Also, proper running shoes are important and abrupt increases in the amount of running should be avoided.

Swimming

The forces that provide for propulsion in swimming are generated by the muscles of the shoulder girdle and, to a lesser extent, by the muscles that cross the hip

and knee joints. Consequently, the most common musculoskeletal problems in swimmers are overuse injuries to the shoulder and knee joints. "Swimmer's shoulder" is a painful condition usually associated with a tendinitis in one or more of the muscles of the shoulder girdle. "Breaststroker's knee" is knee pain that occurs during and after performance of the kicking movement that is characteristic of the breaststroke. Risk factors for these conditions include inadequate warm-up, too rapidly increased training dose, and improper stroke mechanics.

Injury risk in swimmers can be reduced by ensuring that stroke mechanics are appropriate and that training distance and intensity are gradually increased. Strength training, flexibility exercises, and proper warm-up also may reduce risk of injury in swimmers.

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6

Aquatics

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Since the 1960s a significant number of public and private school officials have added a swimming pool to their physical plant or included them in the construction of new facilities, recognizing the multifaceted potential of the aquatic classroom. Its value is incalculable when considering the multiplicity of activities and benefits a swimming pool makes possible. A comprehensive aquatic program under the direction of a professionally trained aquatic director provides instruction, recreation, competition, rehabilitation, therapy, and fitness activities for everyone in the school and community from one month to one hundred years of age. The swimming pool can add a measure of safety to the community, furnish an outlet for teenage energies, offer students the possibility to earn college athletic scholarships, and provide social activity for the disabled. It is a source of family activity, wellness, and entertainment. The simple skill of learning to swim opens the door to a vast world of fun and excitement that includes windsurfing, water skiing, and scuba diving.

Unfortunately, hazards such as unsafe design, careless maintenance, or improper supervision and instruction cause accidents that can lead to significant consequences for a victim and the school district. The National Electronic Injury Surveillance System (March 1991) estimates that swimming pools are annually responsible for over 100,000 accidents which require hospitalization. Included in these statistics are the more than 13,000 serious neck injuries and more than 800 drownings which are produced each year in swimming pools. While only about 4% of the spinal cord injuries and drownings occur in school swimming pools, one serious accident is too many. One death

or permanent disability can ruin a school aquatic program, destroy a professional career, and create a lifetime of guilt. Every effort should be made to maximize safety in the various activities offered in a school-sponsored aquatic program. Water quality, professional supervision, lifeguards, proper warnings, safe equipment, and an ongoing program of hazard identification and risk reduction are but a few of the elements that demonstrate a commitment to community safety.

Concern for student and patron safety is a serious matter for all school district employees from the pool custodial staff to the superintendent. To assist school officials in understanding the broad spectrum of their potential liability, the following 40-item general risk assessment is provided.

General Risk Assessment Questionnaire for School Superintendents and Principals

1. Are you aware of what aquatic activities are considered to be high risk?
2. Does your school district employ a trained professional as an aquatic director to supervise and coordinate programs and activities?
3. Is the aquatic director directly responsible for remedial and preventive maintenance?
4. Has the aquatic director taken courses in aquatic facility management, swimming pool operation (chemistry and maintenance), aquatic program administration, and aquatic liability?
5. Are all teachers and coaches who are assigned to the aquatic program currently certified in lifeguard training, standard first aid, CPR (basic life support for the professional rescuer), and as swimming instructors by a nationally recognized agency such as the American Red Cross or YMCA?
6. Do your teachers, coaches, and supervisors possess current certifications from a recognized agency providing instruction in the activity to which they are assigned, e.g., swimming, coaching, scuba diving, pool operations?
7. Does the school district provide funding for continuing education or credit bearing certification courses to update or retrain the aquatic director and aquatic faculty?
8. Are maintenance workers provided with funding to attend pool operator and equipment maintenance workshops?
9. Have aquatic facility and program safety policies been established and published in a pool operations and administrative manual?
10. Does your school have an ongoing program for updating aquatic policies and procedures?
11. Does the school administration and aquatic staff have a complete understanding of the legal process which can follow an accident in the school district's natatorium?

12. Do your teachers and coaches provide a safety orientation for students at the outset of each school activity?
13. Are you familiar with the aquatic skills and activities and methods of instruction that teachers and coaches are conducting in terms of their risk potential to students?
14. Have policies been established for class and club trips that involve aquatic activities to be directly supervised by the aquatic director, and are school lifeguards assigned to the activity if the visit takes place to an unguarded facility?
15. Does your school district have a standard form and a system for reporting aquatic accidents?
16. Are emergency and accident management procedures written and rehearsed to assure a prompt organized response?
17. Have emergency and accident management procedures been reviewed by your attorney, school doctor, school nurse, and local paramedics or hospital officials?
18. Are emergency and accident management drills conducted at least monthly, and on occasion during peak facility use?
19. Is your natatorium operated in compliance with state codes and design manuals, especially in regard to warning signs, depth markers, and safety equipment?
20. Are all accidents carefully investigated and reviewed with school authorities with corrective action taken?
21. Are safety inspections of facilities and equipment made weekly by the aquatic director with a report or checklist filed in the appropriate office?
22. Is a hazard analysis conducted by an external, professional aquatic consultant at least once every three years?
23. Prior to being put into use, is all new equipment inspected for defects or deficiencies which could lead to an accident?
24. Are in-service water safety workshops conducted annually by the aquatic director for aquatic teachers in the school district?
25. Are you familiar with all local, county, and state safety and health regulations and design standards which affect the operation of your program and natatorium?
26. When building a new natatorium or rehabilitating an old one is a professional aquatic consultant retained for the duration of the project to assure that all aspects of safety are considered?
27. When building a new natatorium or rehabilitating an old one is the school's aquatic staff involved in the design and implementation process?
28. Is worn out safety, instructional, competitive, fitness, and recreational equipment replaced or rehabilitated as needed?
29. Is the aquatic staff involved in the procurement of safe, quality aquatic equipment?
30. Are you familiar with state department of education guidelines for assigning teachers, coaches, and directors to classes, teams, and school-sponsored aquatic activities?
31. Have safety rules regarding equipment and activities been conveyed in writing by the aquatic director to all aquatic teachers, coaches, and program leaders?
32. Are all your students covered by accident insurance?

33. Are your teachers, coaches, and supervisors covered by a minimum of three million dollars of liability insurance?
34. Are participants in competitive and high risk aquatic programs required to provide evidence of a physical examination with participant approval granted by the certifying physician?
35. Are participants in competitive and high risk activities required to provide an agreement to participate or an informed consent document signed by a parent or guardian if the participant is of minority age?
36. Are warning signs (no diving in shallow water; safety rules specific to the diving boards, slides, scuba gear, flotation devices) posted in your pool, included in the administrative manual, and conveyed to program participants verbally or in writing?
37. Do your teachers and coaches carefully inspect equipment before class or practice in order to assure its safe use?
38. Is your pool currently equipped with essential first aid, life support, and lifeguarding equipment such as a pocket mask, spine board with a head immobilizer, and cervical collar?
39. Can pool maintenance staff members swim and if not, are they required to wear a personal floatation device?
40. Is a daily pool log (chlorine levels, pH, temperature, Langelier Saturation Index, and water clarity) maintained with copies submitted monthly to the appropriate local or state health department?

Each of the 40 questions should be answered with a "yes" or "no." The following scale is provided to help you evaluate your general risk level.

General Risk Assessment

Number of "no" answers	*Risk Level*
2	Relatively safe
4	Marginally safe
5	Unsafe
7	High risk
8 or more	Triple your liability insurance or pull the plug!

Understanding the major hazards of swimming pools and aquatic programs and preparing effective strategies for accident prevention in the aquatic environment are related to the following four areas of concern: design, maintenance, supervision, and instruction.

Design

New Pools

Accident prevention begins with the architect or engineer hired by the school district. A pool designer should be retained on the basis of having successfully designed many pools during their career. If your pool would be the first one a firm has designed, seek out a new architect.

Be sure that the design meets or exceeds all current design criteria established by the following:

1. State health department
2. County and city health department
3. Professional aquatic design standards
   Council for National Cooperation in Aquatics
   American Public Health Association
   American Alliance for Health, Physical Education, Recreation and Dance
4. Federal government
   Department of Health and Human Services
5. Competitive aquatic sport groups
   National Collegiate Athletic Association
   U.S. Swimming Association
   U.S. Diving Association
   National Federation of State High School Associations
6. Aquatic safety agencies
   American Red Cross
   YMCA of the USA

When the architect's plans are submitted for approval a comparison should be made with design standards and guidelines issued by the aforementioned groups. Often design manuals used by architectural firms are not up to date with design standards established by competitive, governmental, and safety agencies. Be sure that the plans are submitted to the state health department for their approval.

In addition to hiring an experienced architect the Alliance recommends retaining an aquatic expert, experienced and skilled in design safety and aquatic liability, to review pool drawings and recommend necessary changes.

Older Pools

Two hazards are apparent with older pools, those designed and built in the 40s and in the 50s and 60s. First, some design features once thought to be safe, such as hopper and spoon shaped bottoms and safety ledges, have proven over the years to be the direct cause of many serious accidents. Hopper and spoon shaped bottoms are deceptive and dangerous for divers who enter the water from the side of the pool and from a springboard into what appears to be 12 feet of water, only to discover that the pool is 12 feet deep in a very small area, a close distance directly in front of the board. Diving into a hopper bottom pool is analogous to diving into a funnel.

The second design problem is related to water depth equipment and technology. Diving from starting blocks located 30 inches above the deck into water 3 1/2 to 5 feet deep has always been dangerous. With the advent of the racing dive known as the "pike," "shoot," or "scoop" start competitive swimmers are being exposed to unreasonable risks and are sustaining paralyzing cervical injuries. High performance competitive type diving boards are enhancing the performance of varsity divers and, unfortunately, recreational divers as well. Many older pools are not compatible with "high performance aluminum" diving boards, yet coaches and teachers are demanding state of the art equipment without considering its effect on diving safety, especially for instructional and recreational divers. Depth of water and the amount of deep water in the landing area are sometimes overlooked in the excitement of purchasing a new diving board. Of equal concern is the number of paralyzing injuries occurring annually from recreational and beginner divers who dive from the deck into less than 5 feet of water. The problem has become so acute that the American Red Cross (1988) has established 9 feet as the minimum safe depth for diving from pool side.

The following checklist provides a quick reference in helping to identify some of the common design hazards found in both new and older pools. Each item should be evaluated and marked as "pass," "deficient," or "fail."

Design Hazard Checklist

	Area	*Item*
1.	Pool entrance:	Entrance at shallow end
		Locks are operational
2.	Pool deck:	Nonslip
		Slope—good drainage
		Depth markers 4-6 inches high on contrasting background

		Depth markers on vertical wall
		Depth markers on deck
		Depth markers displayed in feet and meters
		No obstructions or tripping hazards
3.	Pool walls:	Smooth finish
	(underwater)	No obstruction or protrusions
4.	Pool bottom:	Smooth surface
		Marked for depth perception
		Marked at breakpoint
		Drain grates screwed in place
		Safety ledge visible from above and below water
		Hopper/spoon shaped bottom marked for depth perception
5.	Ladders:	Attached securely
		Nonslip steps
		Edged in contrasting color
6.	Lifeguard chair:	5–6 feet high maximum
		Positioned at pool edge
		Safe seat and steps positioned for 100° observation
7.	Starting blocks:	Located at deep end (more than 5 feet)
		Clean, nonslip surface anchored securely
		Clean, nonslip steps
8.	Diving boards:	Anchored securely
		Clean, nonslip surface
		Mount anchored
		Clean, nonslip steps
		Double handrails extending 1 foot over water
		No more than 12 inch space between double handrails
9.	Diving area:	12 foot depth—1 meter
		13 foot depth—3 meter
		Depth extends forward 20 feet from board tip
		Depth extends 8 feet on either side of board
		Depth extends under board back to wall
10.	Lighting:	Deck (100 foot-candles)
		Water surface (100 foot-candles)
		Underwater (100 lamp lumens/sq. foot of pool surface)
11.	Signs and warnings:	Pool rules large enough to see from a distance
		Pool rules located at entrance
		Diving rules located on or near diving mounts

Exit signs
Men's and women's locker room signs
"Danger—Shallow Water—No Diving" printed on pool coping every 25 feet where depth is less than 5 feet
International picture signs for foreign swimmers

12. Safety equipment:
Ground fault interrupters—all outlets
Telephone with direct outside line
Telephone script message and emergency numbers posted next to phone
Emergency lighting system and generator
Self-contained breathing apparatus
First aid kit
Oxygen
Reaching pole
Rescue tubes and ring buoy
Backboards with head immobilizer and three sizes of cervical collars (S, M, L)

Maintenance

Safety is directly related to good maintenance practices as well as to compliance with local and state regulations. Copies of pool regulations should be obtained annually from local and state health departments. They should be kept on file and reviewed frequently. Some states require that a copy of their regulations be posted in the pool area for the public to see. Failure to comply with these regulations can lead to conditions causing accidents and makes the school district liable in the area of negligence per se or direct violation of the law.

Regulations common to all states pertaining to pool operation include the items listed below. Does your school swimming pool meet the following regulations? Each one should be given a "pass" or "fail" response.

Regulations

1. Copy of regulations on file
2. Current pool permit on file
3. Electrical inspection up to date
4. Proper rescue and first aid equipment on deck
5. Pool operations report maintained and submitted to health department when required

6. Bacteriological analysis conducted as required
7. Chlorine and pH tests conducted as required
8. Water turnover rate maintained (5–8 hrs.)
9. Self-contained breathing apparatus available and in working condition
10. Water clarity maintained as required by law (usually 6 inch black disc visible on bottom from anywhere on deck around deep end)
11. Water level maintained above gutter or skimmer
12. Test kit available with fresh chemicals
13. Capable manager or aquatic director in charge of pool
14. A certified lifeguard on duty for all aquatic classes and activities
15. Hazards reported and eliminated
16. Depth marking — proper size and location
17. Material Data Safety Sheets for all chemicals
18. Warning signs and depth markers in compliance with state and local regulations

The custodial staff can reduce the risk of all aquatic programs through proper water quality, proper care of the deck area, appropriate pool equipment, and safe handling of the many types of chemicals common to pool operations. Maintenance contributes to pool safety and risk reduction in three ways: (1) daily operations, (2) remedial practices, and (3) preventive maintenance.

Daily operations consist of routine procedures such as testing the water for chemical levels and adjusting them to comply with regulations and professional standards; cleaning filters as necessary; cleaning the deck, starting blocks, and diving board surfaces; adjusting the water level; vacuuming the pool; and maintaining correct water and air temperatures and humidity levels. Good daily practice includes proper storage of all types of equipment, maintaining above water and underwater lighting, and checking safety equipment. One of the most frequent causes of diving and drowning accidents is cloudy water, which is directly related to filtration and water chemistry. Filters should be cleaned and maintained at a turnover rate of 5–8 hours.

Water clarity and swimmer comfort are easily controlled if the pool environment is maintained as follows: How does your pool rate? Use a "pass" or "fail" response for each item.

Ideal Pool Environment Factors

1. Air temperature: 3 degrees higher than water temperature
2. Humidity: 60–70%
3. Clarity: .1–.2 JTU (Jackson Turbidity Units)

4. Filtration: 5–8 hour turnover
5. Water level: over the gutter (when pool not in use)
6. Vacuuming: every 1–2 days
7. Decks: disinfected 2–3 times a week
8. Langelier Saturation Index: between -.3 and +.3
9. Free chlorine: 1.0–1.5 ppm
10. Chloramines: less than .3 ppm
11. pH: 7.4–7.6
12. Total alkalinity: 100–150 ppm
13. Calcium hardness: 100–400 ppm
14. Total dissolved solids: less than 800 ppm

Routine daily maintenance should be recorded in a daily pool log that is accessible to custodial and aquatic staff. The log should contain information such as:

1. Who opened the pool and time opened
2. Name of lifeguard for each class/activity
3. Environmental factors—chemical levels, Langelier Saturation Index, humidity, air and water temperature
4. Filter cleaning
5. Type and amount of chemicals added
6. Vacuuming
7. Miscellaneous maintenance
8. Who closed pool, who witnessed the securing of the pool, and time closed

Remedial maintenance consists of making repairs as soon as notified, if the condition can lead to an accident. A remedial maintenance form should be completed by the staff member who identifies the condition. The form should be completed and forwarded to the maintenance or housekeeping staff with a copy forwarded to the administration and one retained by the aquatic director. Such a form should include the following information.

Remedial Maintenance Form

Part I — Identification of Condition

1. Hazardous equipment or condition: _____
2. Maintenance/housekeeping notified: _____ _____
   Time Date
3. Administration notified: _____ _____
   Time Date

4. Reported by: _____
5. Action recommended: _____
6. Action taken to prevent injury: _____ _____ (Time) _____ (Date)

Part II — Action Steps

1. Received by maintenance/housekeeping: _____ (Time) _____ (Date)
2. Condition verified by: _____ _____ (Time) _____ (Date)
3. Action steps taken: 1. _____ _____ (Time) _____ (Date)
   2. _____ _____ (Time) _____ (Date)
   3. _____ _____ (Time) _____ (Date)
3. Action steps completed 1. _____ _____ (Time) _____ (Date)
   2. _____ _____ (Time) _____ (Date)
   3. _____ _____ (Time) _____ (Date)
5. Action verified complete: _____ (Aquatic Director) _____ (Time) _____ (Date)

Preventive maintenance is an ongoing process that involves continuing education, seeking out potential hazards, and reducing or eliminating risks. Continuing education includes course work in pool chemistry/maintenance, aquatic facility management, and aquatic liability. For example, your pool custodian could complete a pool operations course such as:

1. Your state health or environmental resources department courses
2. YMCA Pool Operator on Location (POOL) program
3. National Recreation and Parks Association Pool Operators Course
4. AAHPERD Aquatic Council Pool Chemistry/Filtration Course

Annual maintenance helps eliminate potential hazards. Questions involving annual maintenance involve cleaning and inspection. Does your maintenance staff annually:

1. Drain the pool (if possible)?
2. Clean sand filter surface or the diatomaceous earth filter elements?
3. Clean chemical feeders and containers?
4. Inspect the bottom and drain covers and regrout, paint, or repair?

A weekly safety inspection is also a part of preventive maintenance that is often overlooked or considered too time consuming. A simple weekly check sheet should be completed and kept on file. The following equipment and areas must be carefully inspected:

1. Walkways
2. Fences
3. Doors/locks
4. Pool office
5. Locker rooms
6. Warning signs, rules, and exits
7. Shower room
8. Drying room
9. Rest rooms
10. Pool entrance
11. Deck
12. Safety equipment
13. Fixed equipment
14. First aid supplies
15. Filter room
16. Chlorine room
17. Chemical room
18. Chemical containers
19. Storage room
20. First aid room

Supervision

Supervision and instruction are safety factors that combine with safe design and proper maintenance to provide the lowest possible risk in school aquatic programs. Supervision is simply defined as being in charge of others as they participate in aquatic activities. The supervisor can be the aquatic director overseeing the daily operation of the pool or the teacher who fulfills supervisory functions while conducting the duty of instruction.

Swimming and aquatic activities have long been recognized by the teaching profession and the courts as hazardous, requiring close supervision and careful instruction. All aquatic activities require constant supervision by a teacher/coach and a certified lifeguard. The elements of safe aquatic supervision include personnel, the pool environment, safety equipment, and an organization and control system, including record keeping and insurance.

Personnel

Those personnel employed by the school to teach swimming are the most significant factor in providing the school district with safe instruction. Of primary concern in the supervisory process is the aquatic director. A professional aquatic director should possess the following qualifications:

1. BS in Education: Emphasis or major in aquatic administration.
2. Three to five years teaching/aquatic facility administration experience.
3. Instructor certification by the YMCA or Red Cross in swimming, lifeguard training, CPR, and standard first aid and basic certification in swimming pool operations and aquatic facilities management.
4. Experience as participant or coaching aquatic sports (swimming, diving, water polo, synchronized swimming).
5. Knowledge of a variety of aquatic activities: springboard diving, scuba, synchronized, adapted aquatics, aquatic fitness, and pre-school swimming (basic or instructor level certifications preferred).
6. A recognition certificate by the Aquatic Council of AAHPERD as a Teacher or Master Teacher in any of the council's 16 subject areas demonstrates a high level of professional competency.

Another concern is for the faculty who teach courses in the aquatic curriculum. Their qualifications should include:

1. BS in Education: Emphasis as an aquatic specialist.
2. Certification as a YMCA or Red Cross swimming instructor.
3. Certification as an instructor by YMCA or Red Cross in the aquatic specialty area that the teacher will be responsible for in the school curriculum.
4. Certification in lifeguard training, CPR, and standard first aid.
5. Recognition certificate by the Aquatic Council of AAHPERD as Teacher or Master Teacher in the aquatic specialty areas being taught in the school curriculum.

Lifeguards are a recognized standard of care and no school swimming program should function without a lifeguard on duty for each class and aquatic activity. This has been a standard identified by the American Red Cross since the publication of its *Swimming and Aquatic Safety* text in 1981. It has been proven repeatedly in the courts that the teacher cannot adequately provide instruction while working simultaneously in the capacity of a lifeguard. Many school districts have employed an adult who resides in the community to provide lifeguard services for their classes, while other schools have employed their own students as lifeguards. Lifeguards, however, must not be assigned instructional duties as their responsibility must be entirely devoted to the ob-

servation and supervision of students in the pool area. Lifeguard qualifications include current certification in:

1. YMCA or Red Cross lifeguard training
2. CPR — basic life support for the professional rescuer
3. First aid — standard or first aid — responding to emergencies course.

Pool Environment

The environment is a key element in the safe conduct of school swimming classes. The environmental factors listed below are necessary to the safe conduct of swimming classes:

1. Lighting — 100 foot candles of illumination at the surface.
2. Clear water — .1 – .2 Jackson Turbidity Units.
3. Signs — emergency exits, entrances to locker rooms.
4. Pool rules and warning signs — enforced and posted in pool areas and locker rooms clearly describing expected behavior in a positive manner. Accurate depth markers and warnings placed on signs and the pool coping prohibiting diving in shallow water are essential.
5. Air temperature — 3 degrees F above the water temperature.
6. Bottom markings — lane indicators in the swimming area or crosses on the bottom 6 feet out in front of each diving board. These markings serve as a point of reference for divers, enhancing depth perception and visual acuity.
7. Walking surfaces (deck, starting blocks, diving boards) — clear, nonslip.
8. Obstructions — no obstructions or equipment left out on the deck. Underwater obstructions such as ladders, safety ledges, hopper bottoms, drain covers, and hydrostatic relief valves must be painted with contrasting colors.
9. Telephone — with a list of emergency phone numbers and a written script posted next to the phone to ensure that all necessary information is conveyed to the 911 dispatcher.

Safety Equipment

Appropriate safety equipment must be available to provide for rescue and first aid. Fundamental equipment includes:

1. First aid kit — developed for aquatic purposes, checked and re-supplied weekly.
2. Backboards — minimum of two designed according to Emergency Medical Services (EMS) or American Red Cross specifications including cervical collars (S,M,L) and a head immobilizer.
3. Reaching poles — at least one on all four sides of the pool.

4. Rescue tubes or rescue cans — at least one on each pool wall and lifeguard chair.
5. Blankets — minimum of two (helpful for shock).
6. Gas mask — self-contained breathing apparatus (SCUBA) in pools which use chlorine gas, bromine, calcium, or lithium hypochlorite.
7. Miscellaneous equipment — O_2 inhalator and splints depending on ambulance response time and state or local regulations

Organization and Control System

The conduct of a safe swimming class is also contingent upon organization and an effective control system. This control system has a minimum of eight components:

1. Lesson plan — written by the teacher and kept on file or close adherence to established American Red Cross or YMCA instructor manuals.
2. Course syllabus — identifies activities which will be taught and specific information on how the class will be conducted. Includes pool rules, class procedures, and specific warnings on known hazards, as well as policies concerning drugs and alcohol. The syllabus should also include a tear off form signed and dated by the student acknowledging that they understand class rules and requirements. These forms should be collected, filed, and retained by the teacher for one year.
3. Oral orientation — covers the syllabus in detail to rule out lack of communication with those students who might not read the syllabus.
4. Emergency/accident management procedures — written and rehearsed, planned responses to each situation which could possibly occur in the facility or program. The following list includes minimal considerations:
   a. Emergencies (no injury at this stage)
      Power failure
      Fire
      Cl_2
      Tornado
      Securing or closing the pool
   b. Accidents
      Drowning/near drowning
      Spinal cord injury
      Severe bleeding
      Trauma — wounds, broken bones
      Seizures
5. Communication — in the event of an emergency, accident, or other situation where it is important to get the attention of the class, a whistle or an

air horn is necessary. An emergency alarm switch in the pool which sounds in the administration or nurse's office may be helpful as well.

6. Active close supervision — the teacher must stay close, especially in high risk activities such as diving, springboard diving, scuba, and water polo. At no time should the teacher or lifeguard leave the class or pool area while an activity is in progress or while students are in the pool area.
7. Record keeping — retain all lesson plans, incident and accident reports, student skill test results, maintenance requests, staff meeting minutes, in-service training logs, and personnel evaluations.
8. Insurance — students should be encouraged to purchase accident insurance. Teachers and aquatic directors would be wise to obtain a minimum of $3,000,000 worth of professional liability insurance.

Instruction

Safe, quality instruction is comprised of several key elements. The important elements of safe instruction include lesson plans, participant readiness, identifying high risk activities, teacher qualifications, and the conduct of the activity. The following list contains important concerns for the safety conscious teacher:

1. Lesson plans — daily lesson plans should be developed in accordance with aquatic texts and standards developed by the YMCA of the USA and American Red Cross.
2. Participant readiness — to determine motoric readiness, students should be screened with a swim test to determine if their skill level justifies involvement in the class. A procedure should also be developed regarding student health and medical excuses which will determine when they can go back in the water after a period of illness. Psychological readiness is also a concern. Some students come to class with learned or perceived fears about drowning. Coercion, embarrassment or force should never be used as a means of gaining participation, especially in high risk aquatic activities.
3. Aquatic activities which have high risk potential:
   a. Diving — teaching or permitting diving from pool side or starting blocks into less than 5 feet of water
   b. Springboard diving
   c. Skin and scuba diving
   d. Beginner and advanced beginner classes
   e. Water polo
   f. Adapted aquatic classes and activities

4. Teacher qualifications
   a. Teachers must be certified in swimming and other specialty activities they will be teaching.
   b. Continued certification must be maintained.
   c. Teachers must update when national agencies such as Red Cross and YMCA change their courses and standards.
   d. Updating in aquatics also includes attending the variety of workshops and courses offered by:
      Colleges and universities
      Aquatic Council of AAHPERD
      Council for National Cooperation in Aquatics
      National Recreation and Parks Association
      State and county health departments

The actual conduct of the aquatic activity is the final step in assuring a safe aquatic experience for all students. Conduct of an activity involves:

1. The lesson plan — of particular importance are:
   a. Psychomotor objectives must be realistic for the swimmer's skill level, justifiable, and consistent with YMCA/American Red Cross standards.
   b. Relate all class activities directly to planned objectives.
   c. Provide clear verbal descriptions of skills, a demonstration or film of the skill, and a great deal of closely supervised practice.
   d. Include written safety considerations in each plan identifying equipment and lifeguard as part of the plan.
   e. Do not deviate from the plan without sound justification.
2. Course syllabus — a handout should be provided which identifies course requirements and performance standards. A statement should also be made requesting participants to identify any medical condition such as hypoglycemia, diabetes, seizures, or allergies which might affect their safety while swimming and diving.
3. Checking safety, instructional, and fixed equipment — items used for rescue or participation should be checked daily and fixed equipment (e.g., ladders, diving mounts and boards) checked weekly. The safety inspection sheet should be dated, signed, and filed.
4. Emergency/accident management procedures — during the first day of class several students should be identified to assist the teacher and lifeguard in an organized response to a class emergency. These students can assist by clearing the pool, keeping other students away from an accident victim, and securing assistance from other school officials.
5. Teacher attitude — the teacher must be a good role model. Pushing students into the pool and clowning on the diving board are examples of unacceptable behavior.

6. Teacher/student ratio — acceptable ratios have been identified by professionals and aquatic agencies.
   a. Beginner/advanced beginner: 1 teacher for 15 students
   b. Intermediate/advanced courses: 1 teacher for 20 students

   Teachers should not be expected to instruct a class with diverse swimming ability without teacher aides (properly certified) or other teachers assigned to co-teach the class. In addition, a lifeguard must always be assigned to each class or activity being conducted in the pool.
7. Class orientation — the teacher should develop a standardized first day written orientation. This written document should be standardized script that is presented to every class on the first day. It should have a place where it can be dated and signed off on when it is presented. A roll and absentee sheet should be attached to this document before it is filed. Teachers must make sure that any student who was absent during the presentation is presented with the material before they are allowed to participate in the class. This first day orientation should include but not be limited to the following items.

Orientation to Aquatic Instruction

1. Pool tour
2. Staff introductions
3. Role of the student, teacher, teacher aides, and lifeguards
4. Pool and locker room rules
5. Class and school rules and regulations
6. Classroom and locker room procedures
7. Emergency procedures — what is expected of the students
8. Special situation procedures
a. Evacuation procedures relating to warm and cold weather
b. Fire drills in warm and cold weather
c. Pre-arranged meeting places outside the pool
d. Weather emergencies
9. Reporting of accidents to the lifeguard or teacher
10. Procedures for entering and leaving the pool area; students must be reminded frequently of class protocol such as:
    a. staying out of the water until being told to enter by the teacher
    b. chewing gum and smokeless tobacco not permitted to be used during class participation
    c. warning about drugs and alcohol
    d. obeying the rules of the pool
    e. identifying other expected behavior

11. Warning — clearly identify high risk activities such as diving into shallow water and tell the students what the consequences are, e.g., quadriplegia. Identify and warn about the proper use of equipment, such as starting blocks and springboards.
12. Aquatic equipment — be sure to use equipment as it was intended to be used by the manufacturer.

Common Negligence in School Aquatic Programs

Listed below are the common causes of liability cases identified by attorneys, expert witnesses, and professionals over the past 20 years. They are:

1. Improper location or absence of a lifeguard.
2. Improper location or absence of the teacher or coach.
3. Inattentive teacher or lifeguard.
4. Unacceptable teacher/student ratios.
5. Large classes (more than 20 students) with diverse skill levels (beginner to advanced level) under the direction and supervision of one teacher.
6. Improper instructional techniques.
7. Failure to use lead-up skills or acceptable progressions and follow written lesson plans.
8. Failure to warn and identify the consequences of student behavior.
9. Equipment failure.
10. Inadequacy of instruction (teacher unqualified or uncertified).
11. Expired aquatic certifications (failure to recertify) and false certifications.

Aquatic teachers should know that all accidents cannot be prevented. However, reasonable attempts in conjunction with material provided in this chapter along with documentation will provide an excellent defense. Caring and professionalism do count.

Class Trips and Field Experience

When a school uses a facility other than its own to conduct aquatic activities, the principles of safety, design safety, risk assessment, staffing requirements, and risk management procedures discussed in this chapter are the same.

The primary responsibility for the students' supervision and safety is with the school and the teacher who chaperons or supervises that activity. The school and the teacher must conduct the activity at the facility as if it were their own. The standards of supervision and care do not change and can not be passed on to the host facility. Teachers and schools are the primary care

givers for their students and must ensure that students are provided with proper supervision at all times.

The aquatic director should assist in the planning process for biology field trips, aquatic club trips to water parks, and class trips to campgrounds or other facilities with a pool, lake, or water slides. An inspection of a site should be conducted prior to the class activity. If the facility or site does not have lifeguard supervision the school should supply an adequate number of lifeguards along with a teacher who possesses current aquatic certifications.

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7

Archery

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Archery is an exciting, challenging sport. Because of the equipment used, however, it can also be a dangerous and potentially lethal activity. For this reason, it is imperative that both the supervisor and the participant know and appreciate the risks. Simple carelessness with a bow and arrow can result in serious injury. Safety, then, must become a stringent habit for all concerned.

The recent rise of lawsuits due to negligence has focused the public's attention on the need for qualified supervision, appropriate emergency procedures, proper equipment and facilities, and attention to detail. It is the teacher's responsibility to provide a safe environment in which archery can be taught. Not only must the student understand what to do and why, but also what not to do and why not. Failure to explain the dangers involved could result in a lawsuit. A person who has "failed to warn" adequately can be held liable for resultant injuries.

Archery is a rewarding activity. Infuse respect for safety in your students, and you will have a safe, enjoyable program.

Supervision Checklist

1. Only qualified people should supervise archery.
2. Keep the class size small. Have no more than four people shoot per target. A partner system can work well, and classes may shoot in flights.
3. Never instruct from in front of the line when arrows are nocked.

4. If correcting someone, do not put your hand or arm in between their bowstring and bow. They may release the arrow, and you may get hit by the string.
5. Emergencies.
   a. School, club, or camp emergency procedures should be delineated well in advance and posted.
   b. Know the location of the nearest telephone. If it is a pay telephone, have the appropriate change available as well as telephone numbers needed.
   c. If you are outside, bring a first aid kit with you. If the target range is a considerable distance from any phone, perhaps you could obtain a walkie-talkie to call for assistance.
   d. Have current first aid certification.
6. Establish clear directions, either by voice or by whistle, to begin shooting, to cease fire, and to retrieve arrows.
7. Emphasize that each participant shares the responsibility for safe conduct of him/herself and of others. The warning cry is "Hold your arrows!" Teach it and practice it so that there is instantaneous response.
8. If you wish to have several archers shooting at different distances at the same time, always move the target, never the people. Never have more than one shooting line at any given time.
9. Assign specific equipment to each student after checking it carefully, particularly arrow length. It is helpful to post the students' names and which equipment has been assigned for their future reference.
10. Keep all unused tackle locked up.

Indoor Range Checklist

1. Locate the range away from other simultaneous activities.
2. Have easy visibility within and around the area.
3. Any door to the target range should be closed during class. Post signs "Archery in progress." It is helpful if the locks on the doors permit people to leave the area but not to enter it. Unsuspecting people may wander into the area and unknowingly become a target. If possible, have entries limited to behind the shooting line.
4. Put up an appropriate backdrop to catch those arrows which miss the target. It can be a specialized archery backdrop curtain or bales of hay.
5. Have clearly marked shooting lines. The archers will straddle the line while shooting. A good set-up is to have one shooting line with targets placed at different distances.

6. Any obstacles or other activity equipment should be removed from the area.
7. Targets should be mounted securely. If target mats are placed on roll-away stands, archers should check their sturdiness after each end. An unbalanced target of any type could pitch forward and injure participants and/or arrows in the target.
8. Post safety rules.

Outdoor Range Checklist

1. Use natural terrain when possible. Having a grassy hill behind your targets eases the task of looking for arrows.
2. As much as possible, choose an area free of obstacles: trees, telephone wires, rocks, goalposts, and the like. A considerable area behind the targets should also be cleared.
3. Mark the target area well. Rope it off and post signs. Access to the range should be limited to participants.
4. Have clearly marked shooting lines.
5. Targets should be secured.
6. Keep grass mowed well. Long grass hinders the archer from locating missing arrows.
7. Post safety rules.

Equipment Safety

If the archery equipment is kept in good condition, then chances for accidents and injuries lessen, and learning is enhanced. Poorly maintained equipment represents an accident waiting to happen. Equipment failure can be due to a manufacturing flaw, abuse, aging, or just plain neglect. It is imperative that equipment be inspected when purchased, before and after each season, and in some cases, before each end shot. Share this responsibility with the archers, and the job can be done quickly and efficiently.

Arrows Checklist

1. Any arrow that has a split, crack, or a deep puncture should be destroyed and discarded to prevent its use. Do not shoot damaged arrows.
2. Before each end, check carefully to see if any arrow that missed the target was hit by another arrow. Look for a puncture mark and test the arrow's

rigidity. If the hole is too deep, and the arrow begins to crack, destroy the arrow.

3. Tips and nocks should be whole. If not, some can be removed and replaced with glue.
4. Blunt tips should be sharpened; check with your maintenance department. Arrows hitting hard objects can cause the tip to be driven into the shaft. If there is any resultant splintering on the arrow shaft, sand off the splinters.
5. The fletching (feathers) should be whole and secured. If they are not, it can cause the feathers to penetrate the bow hand when shot.
6. Students must shoot with the proper length arrow. Too short an arrow can be overdrawn which is extremely dangerous. Either the arrow could be shot into the bow hand or, if drawn far enough, could hit the inside of the bow and shatter in the archer's face. It is better to shoot with an arrow that is bit too long than one that is too short.
7. Excess dried glue around the feathers should be sanded to avoid any abrasion (feather cuts) on the bow hand as the arrow is released.

Bow Safety Checklist

1. Limber up each bow gradually, if it has not been used for several days, with gentle quarter or half draws. This reduces the chances of the bow breaking due to too much stress too soon.
2. Bows are designed to bend in a certain direction and on a particular plane. When stringing, brace the bows carefully on the desired plane to avoid damaging or breaking the bow. Make sure bows are not strung inside out.
3. Before bracing, make sure the string is secured in the bottom notch. Inspect the bow for splits, tears, cracks, or any suspicious damage. Stress marks in fiberglass bows appear white in color. Stringing a damaged bow can cause the bow to break.
4. As you brace the bow, use sufficient pressure to bend it so that you have enough room to move the string up the bow and not get your fingers caught. Secure the loop into the upper notch. If the string goes beyond the bow and comes off, the bow may rebound into the archer's face.
5. Check the strings for undue wear and tear. Replace them immediately with strings of proper length that match the poundage of the bow.
6. Apply beeswax to any strings that are separated. (Rub with a towel to create heat. Do not put beeswax on the serving; use paraffin, if needed.)
7. All bows must be strung to their proper fistmele, or distance between bow and string. Too little can cause a severe wrist slap; too much may result in a broken bow.

8. Do not go into full draw position and release without an arrow on the string. Either the bow or string might break.

Class Organization Checklist

1. Wear simple, comfortable clothing. Secure long hair away from the bowstring. Remove bracelets, necklaces, watches. Bulky articles in shirt pockets such as pens, pencils, and eyeglasses should be removed before shooting. Sleeves, sweaters, or jackets which are pushed up at the bow arm elbow should be smoothed out. The released bowstring could be caught and impeded by any of the above.
2. Flat, rubber-soled shoes are best for indoor shooting, not only to protect the floor, but also to assure a constant height when shooting. Appropriate footwear is important when shooting outdoors. When on a club range, archery golf course, or when hunting, sturdier shoes are advisable for sure footing and for protection from thorns, underbrush, and poison ivy.
3. Watch students brace their bows. Be sure they do it correctly. Have them check that the bow is not strung inside out.
4. All arrows must be checked for safety. (See previous section.)
5. Assign no more than four students per target. Check to see that the bows are right-side up.
6. Shooters will straddle the clearly defined shooting line and will wait for the signal to begin shooting. Review, also, the warning cry of "Hold your arrows!" (In field archery, cry "Timber" before shooting.)
7. When finished, all shooters will step back from the shooting line and wait until the command to retrieve arrows has been given. All arrows are retrieved at the same time.
8. Beginning students will tend to support their arrow with their bow hand index finger. Instruct them to wrap that finger around the grip before releasing the string; otherwise they will experience a feather cut and impede arrow flight.
9. Beginning students will tend to extend or to hyperextend their bow arm elbow. Unless they turn that elbow slightly out, the string will slap the elbow and/or get caught on the top of the arm guard.
10. All shooters should wear arm guards and finger tabs or gloves to protect them from string slap or string abrasion. Check to see that they are on the correct arms and hands.
11. Avoid using high-poundage bows at short distances, as the arrows will tend to go through the target, causing damage to the arrow and to the target.

12. Never point an arrow at anyone. Nock and draw arrow only in the direction of the target.
13. Should an arrow fall from the bow in front of the shooting line, the archer may attempt to retrieve it with the bow. If he/she cannot reach it, it is considered a shot. Shooters may never step in front of the shooting line to retrieve any arrow unless the command to retrieve has been given.
14. If an arrow is hanging from the target, cease fire. Have the student insert the arrow properly into the target. Should it be left hanging, it becomes a target itself and could become damaged.
15. Inexperienced shooters tend to overdraw. Bows are designed to be pulled a certain distance. If they are overdrawn, injury could result: the bow can break; the arrow can break against the belly of the bow; or the arrow can be shot into the bow hand. Emphasize the correct anchor point.
16. All students must shoot from the same line. If you wish different distances, move the targets, not the people.
17. Bow hands too high on the grip can be too close to the arrow rest. When the arrow is released, feather cuts can result.
18. Remind students of the shared responsibility for safety. If they see anything unusual they should call out "Hold your arrows!" immediately. Once the situation is corrected, the signal to resume firing may be given by the instructor.

Retrieval Checklist

1. No one will retrieve his/her arrows until the command is given.
2. One person, the target captain, should remove the arrows carefully. All others should stand away to avoid being poked by the withdrawn arrow.
3. Arrows driven into the target so that the feathers are wholly or partially covered should be retrieved by pulling from behind the target. Those buried in the grass should be pulled from the tip end to avoid further feather damage.
4. Control arrows by holding the tips down. Fan out the arrows slightly to prevent feather damage.
5. Do not run with any archery tackle.
6. No one should return from his/her target until all arrows at that target have been located. This is both for safety and for courtesy.
7. Looking for lost arrows outside in the grass can be difficult, particularly if they are buried. Advise students to keep track of approximate locations of missed arrows.
8. Back at the shooting line, have the students check all their arrows for splits, cracks, blunt tips, splinters, punctures, missing nocks. Replace those

arrows immediately. If outside, wipe moisture and dirt from arrows before shooting again.

9. Count your shooters. Make sure all have returned before firing again. If alone on the range, lean your bow against the front of the target as a signal you are up there looking for arrows.
10. Never stand and instruct from in front of the shooting line when students have arrows nocked.
11. Allow no horseplay, running, or loud noises on the archery range. Shooting safety is serious business.

Equipment Care Checklist

1. Hang bows up, unstrung, when not in use or place in bow cases. It is helpful to group bows by poundage.
2. Arrows should be stored vertically and separately, to prevent warping or damage to feathers. Store arrows by length for easy reference.
3. Keep all tackle in a cool, dry place.
4. Periodically, wax the string with beeswax and the serving with paraffin.
5. Wooden bows and arrows can be cleaned with Butcher's wax. Fiberglass equipment needs to be wiped with a clean, damp cloth and then wiped dry.
6. Treat leather tackle with any standard leather cleaner/preservative.
7. Keep all tackle locked up when not in use.
8. Dry the matts before storing.

8

Basketball

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Basketball is an American game and has earned a reputation as an easy, safe game that everybody knows how to play. In reality,there are countless students who really don't know how to play the game skillfully, and that situation creates potential safety problems.

Basketball requires physical stamina, speed and quickness, strength, explosive leg power, agility, and grace. It is a sport with the potential for extensive physical contact. Playing on a hard surface in a confined space always involves a certain degree of risk. The extent of that risk is determined in part, however, by the instructor's skill in supervising students as they engage in basketball activity. The ability of the instructor to select appropriate skill experiences for the student is essential. A logical class lesson with learning progressions must be developed and implemented. Finally, the environmental conditions must be controlled to minimize risks.

It is imperative that the physical education instructor has both a knowledge of the mechanics of basketball and a perception of potentially dangerous situations associated with basketball. The instructor must be in a position to anticipate safety problems and to plan strategies that will eliminate or reduce potentially serious situations.

Supervision

A typical basketball class will consist of 25 to 40 students in a gymnasium facility that includes a 50' x 94' basketball floor. The facility can be further

divided to accommodate game play by using the width of the court rather than the length, yielding a court size of approximately 40' x 50'. The role of the instructor is to provide safe supervision for each student in that confined space. Strategies associated with the quality of supervision, the form of organization and control required, and the planning necessary are identified below.

Quality of Supervision

The quality of supervision of a basketball class requires that the instructor have a knowledge of:

1. ***The mechanics of basketball.*** It is important that the instructor understand how correct execution helps establish a safe participation experience for all students.
2. ***Skill progression.*** The instructor must be knowledgeable enough to place skill acquisition experiences in perspective through a well-designed and thought-out progression.
3. ***Skill analysis.*** The instructor needs to be knowledgeable and analytical in viewing skill. Incorrect mechanical skill execution can lead to misuse injuries.
4. ***Student readiness.*** The instructor must comprehend the wide variety of readiness levels of students and be able to place each student in a safe and productive learning environment.
5. ***Student capabilities.*** The instructor must understand the student from a physiological, psychological, and psychomotor perspective.
6. ***Student behavior.*** The instructor must be able to comprehend and cope with student behavior in a manner that will enable the class to operate safely and efficiently.
7. ***Injuries associated with basketball.*** The instructor should have a background that permits an insight into the treatment of injuries, their causes, and their seriousness. This background includes an understanding of the nature, treatment, and prevention of:

blisters	eye injuries
calluses	finger injuries (e.g., jammed fingers)
sprains	trauma injuries

Quality supervision also requires that the instructor sense the "messages of the gym." An example of this would be recognition of the potential for altercations between students due to frustration levels associated with the contact that occurs in basketball. Normal behavior of students is also part of this "message of the gym." In a group of 30 students there is always the potential for misbehavior that can create a safety concern. Good supervision includes organizing teaching stations in a logical manner and creating, enforcing, and

modifying rules based on the physical, psychological, and emotional readiness of the students.

Organization and Control

The organization and control of a basketball class centers on the skills of the instructor. Following are requirements of maintaining this aspect of supervision:

1. The instructor must always maintain a visual and physical presence with each student. It is not acceptable to simply be in the area. There must be interaction with the students in the class, and the instructor must establish a position in the basketball area so that the total class can be observed even when the instructor is working with a single student or a small group.
2. The instructor must develop a set of safety rules to be distributed as a class handout and posted. In addition, these safety rules must be conveyed verbally to students on a regular basis. These rules include:

- No one may engage in a basketball activity unless the instructor is present.
- All basketballs are to be removed from the playing court area and placed on the ball racks after use.
- Basketball shoes are to be worn during class.
- Abusive use of elbows and other forms of illegal contact are not permitted by basketball rules or as a practical play situation in class and will not be tolerated.

Effective Planning

Planning of a basketball class is crucial to the safety of all students. Planning should include a detailed lesson plan, which must be developed for each instructional class. The plan should relate directly to that day's class and specifically identify safety strategies related to the class period.

The lesson plan should reflect an effort to provide a well-supervised situation that would include the identification of:

- organized teaching stations that provide supervision and assistance for students practicing skills.
- logical progression. An example, blocking out when rebounding should precede simply going to the basket and attempting to jump up and rebound the ball.
- proper warm-up and cool-down activities based on the recent applied exercise physiology research.

- organized drills that are designed for the particular age and skill level of the class. These drills should be designed to eliminate situations that would create a frustration level leading to physical altercations.
- an instructional experience designed to enhance learning without fear of injury. Drills that place students in unreasonable jeopardy are counter indicated (e.g., loose balls drills have a potential for injury beyond the norm and should be controlled or eliminated; rebound drills have risks; playing five-on-five half court basketball has a greater potential for injury than a reduced number of players).
- specific instructions on the execution of a drill or the play situation. An example would be the need for definitive directions to describe the path players should run during a drill in order to avoid collisions (e.g., running a fast break drill down court and then returning to the start in an organized fashion by running on the outside of the sidelines).

Selection and Conduct of the Activity

The instructor's ability to select the proper class content and develop the safest possible experience for the student is dependent on several variables. These variables are based on the students' maturation level, ability level, and readiness.

Maturation level is of extreme importance in a basketball class environment. In a class with a variety of physical sizes (height, weight, gender, and age) the potential for injury increases. Following are examples of how to reduce that potential for injury through grouping:

1. Establish groups based on height, weight, and age. One method of grouping requires the establishment of a component system that assigns a point value to each size factor, which then provides a balance for any learning experience in which the student may be involved (e.g., all students with a component value of 20–24 are placed in one group, 25–29 in another group, etc.).
2. Select instructional experiences that meet the maturation level of the student. Inserting a drill that requires students to exceed their physical capabilities can result in injury (e.g., a 5'2" student placed in a rebound drill with a 6'1" student with a 40-pound weight advantage is placing both students in jeopardy).

The ability level of a student is also of importance and needs to be considered when planning a basketball class. Mixing highly skilled students with less skilled students can create a safety problem. Again, grouping is of assistance in coping with a variety of skill levels, particularly if a class is assigned

based on a mixed ability level of students rather than designated classes of beginning, intermediate, and advanced basketball.

Two methods of reducing safety problems associated with ability levels are:

- ability group by balancing the skill level of each group during drills and/or play situations.
- ability group by separating skill levels of each group (i.e., highest skill level in one group, next highest skill level in another group, etc.)

Within any ability grouping the instructor needs to instill in the students an attitude of responsibility for their classmates. Highly skilled players need to be aware of their peers who are less skilled and learn to serve as mentors during instruction rather than attempt to dominate a learning situation. Mentorship in this fashion can lead to enhanced learning as well as a reduction of potential injuries.

Student readiness is also of importance. On a practical level a basketball class may consist of students not only with a variety of skill levels, but also with various levels of motor readiness, interest, and motivation. Safety concerns associated with motor readiness include:

1. Stressing body awareness. Basketball requires extensive jumping and movement skills. Students must often be taught to be aware of their individual motor abilities. They also need to be aware of their surroundings, where they are on the floor, how close they are to other players physically, and where they are supposed to be during a given circumstance.
2. Stressing how to fall properly. Some falls are inevitable; an understanding of safe falling techniques helps to reduce the potential for injury. For example, if the student is knocked down when rebounding under the basket or falls while dribbling the ball down the court the potential for injury is reduced if his/her level of readiness for such situations has been increased.
3. Awareness of the physical fitness level of students and the selection of matching skill experiences.

Safety concerns related to student interest or motivation must also be considered when teaching basketball. These considerations include:

1. Assisting students in dealing with fears associated with basketball. The fear of failure, for instance, can result in tentativeness on the court, which can contribute to injury not only to the fearful student but to other students as well.
2. Reduction of the pressures. Remember the common misconception: "Everyone is supposed to know how to play basketball." Therefore it is embarrassing to not perform well. Try to minimize the pressure of game related

situations and consider eliminating the need to excel on a skill test as the requisite for a "good grade."

Environmental Conditions

There are a variety of environmental conditions that impact the safety of a basketball class. These environmental conditions are related to the facility and the equipment used. Being aware of these environmental conditions and eliminating those that have potential to be a safety problem is of extreme importance.

Facility adjustments to meet safety standards are listed below:

1. There must be buffer zones between teaching stations and playing areas. Players who are concentrating on the skill or the game will pursue a loose ball into an adjacent court. A buffer zone of at least six feet must separate courts to avoid collisions.
2. There must be large padded mats affixed to the wall behind every baseline of a basketball court. Typically, there are pads behind the baseline of the length of courts, but seldom are there pads behind the makeshift baselines of courts where students play the width of the court. These areas are actually the sidelines of the length of a court and are usually ignored. Pads must be placed behind these makeshift baselines.
3. There needs to be backboard safety padding on the bottom of rectangular backboards to eliminate injury when a student with excellent jumping ability jumps and risks hitting part of the body on the bottom of the backboard.
4. Breakaway rims should be installed and maintained. A breakaway rim reduces dramatically the potential of a glass backboard shattering. This type of rim provides for the safety of the player by allowing the player to hold onto the rim and come down in a controlled fashion.
5. Rim restrainers are now available to prevent the rim from breaking away from the backboard if the glass on the backboard breaks. These restrainers are required due to the change to breakaway rims and must be part of the total backboard/rim installation.
6. Nets for the basket must be in good repair. Nylon/cotton anti-whip nets are recommended. Chain nets for outdoor rims, although economical, do not protect the hands, wrists, and fingers from cuts and other more severe injuries.
7. Safety belts are a safeguard designed to prevent folded backstops that support the backboard from collapsing and injuring players or spectators. These safety belts are a required safety feature for folded backstops.

8. Outdoor basketball areas tend to lack many of the features of indoor basketball facilities (e.g., breakaway rims). It is important to check for the safety of outdoor basketball areas including tight or bent rims, rust on the rim or backboard, and proper netting. Of particular importance is to establish a series of either goose neck or double poled backstops to support baskets and rims. This form of backstop positions the backstop behind the baseline of the court and provides an appropriate buffer zone. Similarly, careful attention should be given to the provision of ample level surfacing beyond the side and endlines of the designated playing area.
9. Floors must be cleaned on a periodic basis. Both hardwood and synthetic surfaces should be consistently cleaned of dirt during the day just as the floor is swept at half-time of an interscholastic contest. Also, wet surfaces should be dried immediately with towels. Outdoor courts must be free of gravel or other loose materials and kept as clean as possible.
10. All obstacles and equipment should be placed away from the basketball teaching area. Examples of these obstacles and equipment are:
    - basketballs randomly strewn on the court
    - gymnastics apparatus or other physical education equipment located in proximity to the instructional area (even padded and secured apparatus belongs in an area away from a basketball instructional area)
    - nonclass students wandering through the instructional area
    - shirts and other clothing tossed on the court in proximity to the instructional area

Equipment requirements associated with the instruction of a safe basketball class include the following:

1. Protection of the students' eyes through the wearing of protective eye wear. This is highly recommended to reduce eye injuries.
2. Protection of teeth of the student by the use of mouth guards. Again, this is a preventive piece of equipment that is highly recommended to avoid permanent damage to teeth.
3. To avoid scratches that could develop infection it is advisable that fingernails be trimmed and that jewelry that might harm the wearer or another participant be removed by the student (e.g., rings, bracelets, watches).
4. Basketball shoes are a preventive to serious ankle and foot injuries. There is presently a state-of-the-art approach to the development of sport shoes. It should be required that a basketball shoe be worn in a basketball class and a recommendation of appropriate shoes should be made. There are at least three quality basketball shoes produced that reduce minor ankle and foot injuries. A good basketball shoe has:
    - a high collar on the high top shoe

- a Y band, which is a leather strap around the ankle that holds the ankle in the shoe
- a heel counter that reinforces the ankle as the ankle rolls in and out
- a full air mid sole that absorbs shock
- a wider base of the sole of the shoe thus preventing minor ankle sprains

Students should be informed of the advances in the shoe industry and be encouraged to select a shoe that has these features.

There are potential hazards in basketball and with each hazard there is a preventive safety measure. Proper planning, anticipation of potential safety problems, and capable supervision by the instructor contribute to a safe environment for students participating in a basketball class.

9

Dance

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Dance has existed throughout history and over the course of time many dance forms have evolved to fulfill the expressive needs of the people of a specific culture. Therefore, the number of activities that fall under the dance label is extensive, including such forms as folk, square, social, modern, jazz, ballet, and fitness activities. In education, physical educators typically take responsibility for determining which dance forms will have a role in public education.

In the process of making curricular decisions, a number of questions must be asked about each dance activity being considered. Using modern dance, as an example, the questions would be: What is the potential for modern dance to contribute to student learning? Are members of the department prepared to design and teach a quality modern dance unit? Do we have a facility which will adequately support the safe and effective presentation of modern dance? What are the risks associated with modern dance?

Using the answers to these kinds of questions is an integral part of responsible decision making when selecting the dance activities for which physical educators will be held accountable. For example, when teachers know that muscle cramps and strains, sprains, shin splints, foot calluses, and blisters are common to dance they construct lesson plans to reduce the potential for the occurrence of these kinds of physical injuries. This is one important step toward increasing teacher accountability in the area of student safety.

For optimal safety, teachers of dance must increase their awareness of the supervisory concerns of the dance program, clarify their obligation to carefully select and construct the dance activities to be taught, and finally, ensure a

safe learning environment. The teacher who addresses each of these concerns by meeting and maintaining the standards set forth in this chapter can greatly reduce the risk of accidents.

Supervision

Dance, like all other forms of physical activity, requires the instructor to take responsibility for both general and specific supervisory concerns. In general, the teacher of dance must be prepared to teach a variety of skills and movement patterns as these relate to the framework of a particular dance form. More specifically, the teacher of dance is responsible for presenting a well-planned program in a safe and positive learning environment. The following is a checklist that should be referred to when planning and evaluating the supervisory aspects of dance programs.

Teacher Preparation and Adequate Supervision

Content

The elements and learning frameworks of dance one must understand and account for when constructing and teaching dance units include:

1. The design of a warm-up that will raise the student's core temperature, stimulate muscle functioning, and increase the flow of blood and therefore oxygen to the working muscles. This will decrease the potential of injury to ligaments, tendons, and muscles when dancers are asked to move through a full range of movement.
2. The movement and technical element of dance skills.
3. The skill sequences, floor patterns, and rhythmic and energy characteristics associated with a specific dance performance framework.
4. The movement, dance, and/or fitness principles and concepts that must be understood and fulfilled during the learning and performance process.
5. Teaching methods, techniques, and cues to be used to promote effective, efficient, and safe learning.
6. The specific nature of common dance injuries and the first aid treatment prescribed for these injuries.

Individual Readiness

The teacher must be aware of the cognitive, psychomotor, and affective status of each student.

1. Cognitive: The nature and level of knowledge and understanding the student has about dance.
2. Psychomotor: The physical and neuromuscular characteristics of the student.
3. Affective: The attitudes, feelings, and perceptions the student has toward dance and self in the role of dancer.
4. Any specific medical, physical, learning, or emotional problems which might affect a student's learning process.

Environment

A teacher must understand and account for factors that will promote a safe learning space:

1. The requirements of a dance facility.
2. The care and maintenance procedures for that facility.
3. The principles of equipment: proper use, care, and maintenance.

General Organization and Administrative Responsibilities

1. The teacher must remain inside the dance facility throughout the entire class period. Leaving students unsupervised, regardless of reason, proximity, or duration, is negligent.
2. The teacher must be positioned so that the entire class is within his or her vision, even when correction or feedback is being directed to an individual or small group of students.
3. The teacher must effectively locate and efficiently use audiovisual equipment or other learning aids so that continued class supervision is possible.
4. The safe boundaries of the dance area must be communicated so that student safety is ensured.
5. The teacher must understand the body movement, floor patterns, direction, and level requirements of all movements, phrases, and dances being taught. Clarity will contribute to effective student organization and teacher communication, reducing the likelihood of careless collisions.
6. The teacher must continue to monitor individual student's safety regardless of the number of students moving in or through space, so that unpredictable and potentially dangerous problems can be resolved immediately.
7. Planning activities that develop spatial awareness and/or promote student accountability for themselves while moving through a space shared by others will contribute to safety.

8. A clear set of emergency procedures must be developed and approved for use in the event of an accident or injury. The teacher must:
   Verbalize the procedures to be followed.
   Write in clear and simple terms the steps to be taken when there is an accident or emergency.
   Post these procedures in several central locations in the dance facility.
   Run through the procedures with the students to ensure they understand their responsibilities. This is particularly important if students are young and/or cannot read.

Selection and Conduct of the Activity

Many decisions need to be made with regard to selection and conduct of dance activities. Selection refers to the process of determining which dance forms are to be included in an activity program, as well as the specific content to be presented as part of the students' learning experience. Conduct refers to the decisions a teacher makes in regard to the organization and presentation of all content in order to promote optimal student learning in a safe and positive environment. Two categories serve as the organizing framework for this section: (1) general concerns, that is, those factors which should be considered in the selection or conduct of any dance activity; and (2) specific concerns, those factors to be accounted for when teaching a specific dance form. The following guidelines should be followed when planning and presenting a safe and successful dance experience for students.

General Considerations

Program Selection. The following points are important to remember in conducting any activity.

1. Identify a clear purpose and objectives for each dance form which is to be included as part of the activity program.
2. Be sure that at least one instructor is qualified and available to develop and teach each dance activity included in the curriculum.

Lesson Planning. A clear, well-organized, and thorough set of lesson plans will improve teacher effectiveness, reduce or eliminate the need to improvise, and if necessary, provide documentation for a liability defense.

1. Identify the general goal of each class. This should correspond to at least one dance unit goal.
2. State the performance objectives to be fulfilled through student participation activities that comprise a specific class.

3. Specify the dance activities (warm-up, cool-down, skill practice, improvisational activities, performance activities, etc.) which will be used to fulfill the performance objectives.
4. Note and verbalize any safety precautions students should account for while dancing.
5. Select methodologies which will promote a positive, informative, and safe learning experience for the students. Method for delivery may vary from class to class when student developmental characteristics vary.
6. Specify movement variables, skills, facing, level, direction, rhythm, tempo, and other factors that might be important to student safety or success.
7. Note and use a consistent set of safety and performance cues.
8. Identify options. Students with learning disabilities may need to have choices in regard to performance options that will account for their specific limitations.
9. The teacher's expectations in regard to student performance should be specified in the performance objectives and grading should be consistent with those expectations. Objectives should be stated in a way which will account for developmental differences thereby enhancing personal safety and success in dance.
10. Always give students an opportunity to ask questions; their understanding is critical to a safe and successful dance experience.

The student. Identify the level of understanding, ability, and awareness each student has in the following dance movement categories. This information will prepare one to provide students with a positive dance experience because they will be prepared to safely explore, learn, and create movement in carefully considered dance frameworks.

1. Motor skill — the level of readiness and ability to perform the basic locomotor, nonlocomotor, and movement skills inherent in dance activity.
2. Body awareness — understanding one's ability, limitations, and tendencies as a mover/dancer.
3. Movement principles — understanding and ability to embody the conditions associated with the following will promote the efficient and safe use of the body when dancing: centering, grounding, landing, and alignment.
4. Spatial awareness — an understanding of self as a mover through a shared space that has natural or prestated boundaries.
5. Cognitive level — understanding of the terms, concepts, principles, and characteristic movement frameworks inherent in specific dance activity.
6. Affective level — understanding attitudes toward dance and perceptions regarding potential personal importance of dance. Sensitivity to the attitudes of boys may be important when creating a positive and meaningful dance experience.

Student safety. Monitor students' preparation for each class. Students will be ready to dance safely if these policies have been accounted for and followed.

1. Footwear — clarify the appropriated footwear for the specific dance activity, after accounting for the floor conditions, room temperature, and any "special" needs of the students.
2. Attire — clothing should be nonrestrictive so one can breathe and move fully. Layers of clothing should be worn so students can adjust the amount of clothes they are wearing according to the temperature of their bodies. Overheating or being cold can create personal health and/or injury problems endangering student safety.
3. Jewelry and any sharp or protruding objects should be removed because these are potentially harmful to the dancer.
4. No gum or candy should be allowed.
5. Long hair should be tied back.
6. Glasses should be secured to the student's head so they don't fall off when bending or turning.

Dance-Form Specific Considerations

Dance-Fitness activities

1. Prescreen students to determine their level of fitness.
2. Each student should be informed about his or her fitness level and be supported in the clarification of appropriate personal dance fitness goals.
3. Plan a warm-up, work out, and cool-down segment for each class period.
4. Clarify personal options, as these pertain to the intensity, frequency, duration, and movements of the "dance" aspect of each class. Informed students can monitor their own safety when the choices are clear.
5. Continually observe students as they move and make alignment and performance corrections as needed.

Folk, square, and social forms

1. Include a warm-up.
2. Introduce new dance skills prior to the teaching of a dance. Students will feel better able to perform a dance when they are familiar with all the skills which are part of that dance.
3. Orient students to the movement patterns, directions, and formation changes inherent in a specific dance. This will reduce the level of confusion and number of collisions.
4. Each student should know his or her role and the related movement responsibilities (e.g., lead couple).

5. When using a musical recording, identify starting cues and introduce listening techniques so students can identify the rhythmic base and tempo and therefore effectively execute the dance in relation to the music.
6. Provide students with a cue that will be used to stop all activity, for example, stopping the music. This will reduce the potential for accidents that result when moving while disoriented or confused.

Art forms: Ballet, modern dance, jazz, Afro-American dance

1. Prepare students for the day's dance activity by presenting them a warm-up which will prepare them to physically, emotionally, and mentally succeed.
2. Be sure the technical aspects of the movement and dance skills are demonstrated and practiced correctly.
3. Present class activities in a progressive sequence.
4. When teaching a complex or long dance pattern, or a section of a dance, have students learn preset parts of the sequence first, so they have an understanding of all its parts prior to performing the full length version.
5. Note typical or identified performance problem areas so students can monitor themselves as they move, enhancing their potential to dance fully and safely.
6. Be prepared to modify a task for any or all students who have difficulty understanding or doing a dance task so all have an opportunity to participate and succeed regardless of level.
7. Clarify any specific movement qualities or characteristics the students are expected to fulfill as they dance.

Environment

There are two general areas of responsibility that must be fulfilled when providing students with a safe and positive dance learning environment: (1) the facility in which dance classes are conducted must be well maintained and (2) the equipment, or any props being used, must be mechanically sound and safe. The following guidelines are provided to assist the teacher in planning and maintaining a safe environment for a dance program.

Facility

Condition of the floor

1. Is it clean? This is especially important when students dance in bare feet, as in the case of modern dance.

2. The floor must be free from splinters, cracks, chips, or holes. If any of these conditions exist, the specific area(s) should be clearly marked off. When the general condition of the floor surface is bad, dance shoes should be worn at all times and dance activities modified appropriately.
3. Ideally, the floor should be sprung. When the dance floor is nonresilient (wood or tile over cement), reduce or eliminate the amount of time students spend on explosive motor skills. This will reduce the potential for shinsplints and foot, ankle, and knee problems, which result from repetitive landing on hard surfaces.
4. While wearing acceptable footwear, test the floor surface to determine if slippery or sticky conditions exist. Adjust lesson plans to account for either of these conditions. For example, when a floor is slippery, slow performance speed down so body control is possible; when a floor is sticky, eliminate turns which require the dancer to rotate on one foot. These kinds of performance modifications will reduce the risk of injury resulting from floor surface conditions.

Other considerations

1. When possible, move all unnecessary equipment off the dance floor or out of the area. If this is not possible move the equipment to one side of the facility, then pad and/or mark off the area. Be sure students are aware of boundaries.
2. Note extremes in the temperature. When a facility is extremely hot or cold, modifications of the warm-up, cool-down, and intensity or duration of planned activity may be warranted.

Equipment

Audiovisual aids

Audiovisual equipment is often used in conjunction with dance programs and the instructor must take responsibility for the following:

1. Be sure the record player, tape deck, or video equipment is in good working order.
2. Check equipment plugs and outlets in the dance facility to be sure that these are functioning.
3. The instructor should be trained to operate all audiovisual equipment.
4. Operation of the audiovisual equipment is the responsibility of the instructor, unless a student has been trained for this duty.
5. Mechanical problems are unpredictable, so be prepared to use an alternative lesson plan.

6. Class time should not be spent honing an instructor's equipment skills or making repairs. Proper supervision of students is not possible when the teacher's attention is on the equipment.

Props and performance items

1. When using props be sure that all students are clear about how and when these are to be used.
2. Make sure students understand the proper use of props. Accidents and injuries can occur when props are misused.
3. Inspect all props (e.g., bamboo poles for tinikling), prior to use. Any broken or damaged equipment should be eliminated or repaired prior to student use.

The suggestions made in this chapter have been presented as guidelines to support the teacher's effort to present a safe learning experience and environment for the dance program. Meeting and maintaining these standards will help reduce the risks associated with dance. When students trust that their safety has been accounted for, they will be more likely to move and express themselves fully while dancing. A safe dance experience will bring joy and satisfaction to the student.

10

Exercise Programs

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Exercise programs have been in existence for centuries. There remains, however, a great need to reach more people of more age groups with these programs. One question frequently asked by those contemplating the development of an exercise program is, "How shall I begin?" The safety ramifications of this question must be considered when answering. Too frequently, mistakes have been made in answering the question by lay persons, health spa employees, gymnasium directors, teachers, physicians, and others. These persons, lacking an understanding of the specific safety hazards which exist in the conduct of programs of exercise and fitness, may unwittingly be putting the participant at risk.

The purpose of this chapter is to present the risks involved in exercise programs, and to suggest procedures for conducting safe programs of exercise for all. When the elements of risk have been considered during program planning, exercise programs can provide a valuable addition to one's recreational and professional life.

The following material is, therefore, presented as a guide for safety in exercise programs. Supervisory concerns, conduct of the activity, and environmental conditions are presented with a focus on the prevention of injury. Safety procedures for exercise programs that include cardiorespiratory endurance activities, flexibility activities, and strength activities (e.g., weight training) are presented within each of the three areas.

Supervisory Concerns

1. Knowledge of the subject matter dealing with exercise is essential. Certification programs are available which include both study and supervised internships for exercise specialists, strength training specialists, and aerobic specialists. Completion of an approved course of study in exercise physiology is highly recommended.
2. The ability to assess the fitness level of each student and prescribe appropriate exercises based upon the assessment is essential.
3. Instructors must possess a knowledge of progressions in exercise prescription in terms of frequency (how often), intensity (how stressful), duration (how long), and mode (type of exercise).
4. A thorough knowledge of first aid procedures including cardiopulmonary resuscitation (CPR) is required.
5. Instructors must be familiar with the proper use of the equipment common to exercise programs.
6. A knowledge of the current and past research concerning exercise programs is necessary.
7. Safety procedures for the conduct of exercise programs must be established and implemented by the instructor.
8. Emergency procedures should be established and posted

Facilities Management

1. Exercise rooms/gymnasiums must be supervised by qualified instructors.
2. The instructor must be aware of the space demands of each exercising person as well as the space demands for each piece of exercise equipment.
3. The instructor must be aware of the movement patterns of each exercise activity in order to allocate adequate space.
4. Rules of conduct and safety should be developed by staff and students, including:
   - When the area is to be used (hours and days).
   - Who may use the area.
   - Who is in charge of the area.
   - How each piece of equipment is to be used.
   - Where exercises occur in the area.
   - Where equipment is placed and stored.
   - What equipment can be used in the area.
   - What patterns of movement can be used in the area.
5. Each exercise area should have rules of conduct and safety posted.

6. In addition to the proper posting of rules, students should be informed verbally of the rules of conduct and safety.
7. Exercise programs conducted in the pool area require all the regular safety principles presented in Chapter 6, Aquatics.

Planning for Instruction

1. Teaching plans should include:
   - Consideration for safety matters.
   - Placement of equipment.
   - Placement of students for exercise activities.
   - Placement of the instructor for teaching and supervision.
   - Assessment of students' physical status and plans for mode, frequency, intensity, and duration of the activities.
2. The teaching plan should be prepared after consideration of the risks involved in the activity and procedures by which the risks can be reduced and avoided.
3. The teaching plan should provide for individualized exercises to meet individual needs.

Conduct of the Activity

Everyone can improve cardiorespiratory endurance, flexibility, and strength. When a person begins an exercise program, the body adapts. The adaptive responses are the "training effects" of the program. Everyone, therefore, is physically ready at a different level. Assessing that level is essential to proper exercise prescription. An increased potential for injury exists whenever an improper assessment is made.

While underassessing participant capabilities may not present an immediate physical hazard, the resultant loss of motivation can easily lead to a multitude of other problems. The dangers of overassessing a participant's capabilities are obvious. It is better to underestimate capabilities and ensure motivation than to risk injury by overestimation.

The instructor must, therefore, refer to accurate assessment measures when assigning the frequency, intensity, duration, and modes of exercise. Following are guides for assuring safe conduct for exercise programs.

Participant Readiness

A variety of exercise programs are used to improve fitness. Continuous activities such as walking, swimming, bicycling, rowing, dancing, jogging, rope jumping, bouncing, and large muscle exercises with the whole body moving are activities commonly used for the improvement of cardiorespiratory endurance. Calisthenics exercises are used for strength, flexibility, balance, and agility improvement. In addition, a large number of weight training devices have been developed to improve strength and flexibility.

Assessing the readiness of an individual for each exercise is a difficult task. Assessing the readiness of a class of students presents an even greater challenge. Some general rules of readiness are suggested in the following four areas of concern: physical readiness, skill readiness, emotional readiness, and social readiness.

Physical Readiness

1. Review medical records for all students before activity. Exercise limitations may be necessary in the presence of some medical conditions. Medical records should provide historical data as well as the results of recent examinations.
2. Determine the level of muscular endurance, strength, and/or flexibility slowly, allowing ample time for assessment and recording the level for each activity. Body composition should also be assessed. Begin the exercise program at a relatively low level which offers the safety of readiness and the motivation of achievement.
3. Allow parent participation in the assessment by discussing results of any medical examinations or early assessments which indicate a deviation from standard expectations.
4. Keep records of initial and subsequent assessments and use them for individual advising and guidance.
5. Use a continuous activity as a warm-up to the exercise program each day. Vary the warm-up to maintain motivation. Include strength and flexibility activities as well as cardiorespiratory activities. Students should begin to experience sweating before difficult strength, flexibility, balance, cardiorespiratory, or agility activities are added to the routine.
6. Require written permission from a physician to begin activity after an injury or serious illness. Special activities for the injured and low-fitness students are important. It is essential, however, that the aid of a physician be enlisted in the development of such programs.
7. Provide individual programs for all students who have special needs. All students can benefit from some type of exercise. Modifications of inten-

sity, duration, frequency, or mode facilitate the adaptation of exercises for individual needs.

Skill Readiness

1. Review the skill level of all activities to ensure a sequencing from easy to difficult.
2. Be sure that thorough instruction and feedback are provided with regard to all skills and techniques.
3. Start at an appropriate level of skill to ensure safety and motivation.

Emotional Readiness

1. Provide sufficient activity levels to ensure success.
2. Keep interest high with variety in frequency, duration, intensity, and mode.
3. Pressure to increase the frequency, duration, and intensity should come from the student rather than from the instructor.
4. Self-regulation of frequency, duration, and intensity should be instilled in each student. Recognition of preliminary signs of overstress or injury should be taught. Students should learn to understand their bodies and how to recognize when more or less intensity, frequency, or duration is needed.
5. A statement of the risks involved in exercise programs and techniques for avoiding injury should be presented to each student. This should be a written statement in language that all students can understand. After the students read the statement, discussion and an opportunity for questions should follow. These documents, called informed consent forms, should be used to inform the parents as well as the student. While they do not relieve any party of responsibility, students, parents, and school personnel will have a better understanding of the program and their responsibilities and will feel free to consult with the program director when given the opportunity to read and sign consent forms. Appendix A at the end of this chapter provides an example of an appropriate informed consent document.

Social Readiness

1. Group activities are usually more motivating than working alone. Students should be taught to support each other in their exercise activities. This support should not be pressure; it should be encouragement and acceptance.
2. Students should have fun while working hard. Group support enhances the enjoyment.

Curricular Concerns

1. The aim of the fitness/weight training unit should be to meet the needs of the students enrolled.
2. Objectives should be established which lead to fulfillment of the aim.
3. The exercise activities should relate to the objectives.
4. The following general guidelines for the fitness/weight training unit may also be used to further assess the individual exercise activities. The activities should:
   - Increase tone, stability, and control of the body.
   - Prepare the student for more strenuous exercise activities.
   - Meet student needs.
   - Be good for overall fitness.
   - Be progressively sequenced from easy to difficult and appropriate in intensity, frequency, and duration.
   - Be fun and suited to the age and ability of students.
   - Be safe — conducted without injury to students.

The lesson plans should be developed from the unit plan and the lesson objectives should grow out of the unit plan objectives. The following should be considered in the development of individual lessons.

1. Progressively more difficult exercise activities should be planned for each lesson.
2. Safety consideration should be part of each lesson plan.
3. Plans and procedures for safe use of the equipment should be part of each lesson plan.
4. Questionable movement patterns (deep knee bends, straight-knee sit ups, bouncing toe touch, etc.) should not be included in the exercise program.

Environmental Conditions

General Considerations

1. When in use, exercise areas must be supervised by qualified persons.
2. All equipment should be returned to the proper storage area after use.
3. Safety rules for each exercise area should be posted in highly visible locations.
4. Only proper use of the facilities and equipment is allowed.
5. Safety inspections of facilities and equipment should be planned on a regular time schedule and records of the inspection should be kept on file.

6. Regular cleaning of the equipment and facilities is an important safety measure.

Exercise Areas

Weight training room

1. Placement space for all equipment should be clearly marked.
2. Space allocations for all equipment should meet the manufacturer's specifications.
3. The maximum number of participants that can safely use the space should be posted in highly visible locations.
4. Emergency procedures in case of injury should be posted in highly visible areas.
5. Ventilation and lighting must be adequate for the exercise activities.
6. Traffic patterns should be clearly designated.
7. Equipment should be used for specified exercises only.
8. Equipment and facilities should be inspected daily. Careful inspection records must be maintained indicating:
   - Security of all floor and wall anchor points.
   - Safety stop pins present on exercise machines and weight racks.
   - Floor surface free of dust, debris, and moisture.
   - Bars, plates, and machinery are free of rust.
   - All free weight bars have proper fastening hardware.
   - Security of all joints and fastenings.
   - Stability of all benches and platforms.
   - Security of all chains, cables, pulleys, and other moving parts.
   - Cleanliness of mats, benches, seats, etc.
9. Noted deficiencies should be immediately corrected or the faulty equipment taken out of service.

Exercise rooms, outdoor areas, pools, and gymnasiums

1. Ventilation and lighting must be adequate for the exercise program.
2. Storage space for all equipment should be clearly marked and the storage space should be secure if the room is used for other activities.
3. Space limitations and number of participants should be posted in highly visible areas.
4. Traffic patterns for some exercise activities should be established before students begin the activity.

The guidelines presented in this chapter should help attain both fitness and safety goals so that everyone can enjoy a safe, healthy, and worthwhile experience.

Appendix A

STATEMENT OF INFORMED CONSENT

In the prevention of injury in exercise programs, it is important to understand the causes of injury presented below. Injury prevention procedures are listed after each causal factor. Be aware of risks and conduct your personal program in a safe manner.

Causes of Injury	*Preventive Techniques*
Lack of adequate warm-up	Use related rather than unrelated warm-up activities Use active rather than passive warm-up activities Bring the body to sweating temperature gradually during warm-up activities
Lack of adequate cool-down period	Keep moving at a gradually slower pace after exercise Avoid hot showers, hot tubs, and saunas after exercise
Lack of adequate rest (overexertion)	Use a frequency of 3–4 days per week for beginning exercise programs Use low intensity for beginning exercise programs Use short duration for beginning exercise programs Avoid competition for beginning exercise programs
Overextending range of joints	Use short range of movement for beginning exercise programs Avoid painful stretching for beginning exercise programs Use static rather than ballistic stretching exercises
Excessive heat, humidity, pollution, or altitude	Decrease intensity and duration in these conditions Drink water freely during exercise
Using sudden stops or starts or exercising on hard surfaces	Use smooth movements Avoid hard surfaces and sudden stops

Failing to use progression or increasing intensity and duration too early	Slow progression avoids injury Increase intensity and duration when it feels good to the body Reduce intensity and duration when soreness or pain is felt
Failing to listen to the body	Avoid overexertion when sick, fatigued, or injured Avoid being compelled into activity because of habit, friends, or competitive reasons Avoid continuing exercise or completing an activity when the body says stop
Failure to dress for the activity	Dress for warmth and for cooling as dictated by temperature Avoid restrictive clothing Use shoes that fit the activity and protect the foot and leg joints
Failing to check equipment before use	Check all equipment before exercising Use all equipment as specified Clear area for equipment use
Lack of good eating habits	Allow digestive time after meals before beginning activity Maintain good nutritional balance to prevent problems of vitamin and mineral deficits
Lack of proper adjustments in restarting activity after a layoff period	Adjust the exercise program to lower intensity and duration after layoff Adjust the exercise program to lower intensity and duration even when fatigue level seems acceptable (fatigue may not appear in early activity sessions after layoff)
Failure to seek exercise specialist's advice on questions pertaining to exercise prescription	Seek specialist's advice over "quacks" with quick remedies Seek specialist's advice regarding myths prevailing in some exercise groups
Failure to recognize injury	Be aware of types of injuries (blister, joint irritation, muscular soreness, stress fractures, shin splints, tendinitis, etc.) Prevent chronic injuries by caring for all injuries at the first sign

	Avoid injuries by knowing and avoiding the causes
Failure to exercise with proper form and rhythm	Use rhythm in performing activities Use smooth, full-range movement Use proper form and alignment for each exercise Avoid "cheating" on exercises
Failure to breath properly during exercise	Use the mouth and nose in breathing Exhale on exertion and inhale on return (don't hold your breath)
Failure to use spotters for exercises requiring them	Avoid working alone Use spotters in weight lifting exercises Be sure that spotters understand their duties

I have read and understand the preceding guidelines. I agree to follow the injury prevention procedures contained therein.

_____ _____

student name date

11

Field Hockey

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Field hockey is a sport for boy and girls, men and women, of all ages and abilities. It involves the development of speed, stamina, coordination, reaction time, and cooperative teamwork skills. With any physical activity involving an implement, a propelled object, and movement within a confined area of play, there is a need for careful consideration of safety factors. Field hockey can be a safe, fun-filled, and exciting experience if several items are considered before introducing this activity to students. These areas of concern include proper supervision, selection of content, conduct of the activity, and the care and maintenance of equipment and facilities. Thorough planning and preparation are the keys to providing a positive learning experience for all participants.

Competent supervision is an important element in any teaching unit. The more qualified the staff member, the more effective the supervision. As with any sport or physical activity, a teacher with experience as a player, coach, or umpire is more likely to have a complete knowledge of the sport and to be aware of potential safety concerns. If an inexperienced staff member is assigned to teach field hockey, ample time should be given for becoming familiar with the sport. The quality and quantity of supervision improves as the teacher becomes better acquainted with the activity.

Written lesson plans are essential. They must indicate the selection of appropriate skills specific for the age and ability levels of the students. The focus should be on keeping the ball on the ground during instruction and game play. For safety reasons, the scoop and the flick can be omitted from an instructional unit, because these skills can be difficult to control. Giving proper

instruction in various skills, enforcing guidelines for safe game play, and providing the necessary safety equipment are included in the proper conduct of a field hockey unit.

Maintaining safe playing areas and equipment is another concern. Playing areas must be free of obstructions and loose impediments. Keeping the grass short will encourage better stickwork. Space should be left open between adjacent areas to avoid an overlap of activity from field to field. Protective equipment such as shin guards must be provided and used by each student. Goalie leg pads, kickers, chest protector, and face mask or helmet must be used for protection if the goalie is a designated position during class play.

Skillful risk management comes through an awareness of potential problems associated with a specific activity. Teachers who are aware of such problems can plan activities that minimize the risks to the participants. Sound planning and good judgment are important background elements to a positive learning experience. The following lists provide a reference for teachers as they plan a field hockey instructional unit.

Supervision

1. Qualified instructors should teach field hockey. Qualifications include:
   a. thorough knowledge of the sport
   b. up-to-date techniques and teaching methods
   c. first aid training
2. Do not leave the activity area. Maintain visual contact with all students during the entire class period.
3. Be aware of total class activities while giving instruction or assistance to individual students.
4. Establish and enforce safety policies and procedures during the class.
5. Students should not have direct access to equipment. Hockey sticks and balls left out are an invitation to participate in unsupervised activities.
6. Lesson plans should be detailed to show supervisory efforts for maintaining a safe learning environment.
7. Be prepared to provide both general and specific supervision during each class.

Selection and Conduct of Activity

1. Use an established curriculum guide as a comprehensive reference for course content.

2. Select tasks and skills that are appropriate for the age and ability levels of the students.
3. Prepare and maintain written unit and lesson plans for all activities. Specific plans must include objectives, learning experiences, teaching methods, and assessment measures.
4. Individual lesson plans should indicate a progression of appropriate skills and learning experiences.
5. Provide warm-up activities that include jogging and flexibility exercises.
6. Keep accurate records and anecdotal notes of all class activities. These can help in future planning and revisions of unit and lesson plans.
7. Prepare procedures for handling accidents or other emergency situations.
8. Prepare lesson plans for indoor activities that provide the opportunity to continue working on field hockey skills or game strategies if space is available.
9. Enforce the noncontact aspects of the game.
10. Include opportunities for students to officiate. This is another skill activity that will facilitate game play.
11. Warn students of the risk of injury if the hockey stick is used for purposes other than those intended or if the stick is raised too high during skill work or game play.
12. Develop a personal safety checklist for students that includes removing all jewelry, eliminating gum chewing, and securing eyeglasses with a safety strap.
13. Allow student to wear soccer-style shoes for outdoor play only if all students in the class are wearing that style.
14. Group students according to size, strength, and skill.

Modifications

Suggested modifications to skill work and game play in physical education classes, with emphasis on safety, are as follows.

1. Do not teach the flick or the scoop. These are aerial strokes that increase the potential for dangerous play.
2. Limit the backswing and follow-through to waist height.
3. Limit the game play to 5 vs. 5, 6 vs. 6, or 7 vs. 7. Small games develop full-field concepts and give students more opportunities to be involved in the activity.
4. Eliminate the goalie position unless proper protective equipment is provided. Limit shots on goal from outside a certain distance in front of the goal. This will avoid chaotic play within the goal area.
5. Use playing areas as small as 30 x 50 yards depending on size of teams.

6. Discourage the use of reverse sticks when playing. This leads to overreaching and committing fouls such as obstruction and stick interference. Students should be taught to move into proper position to avoid the reverse play.
7. Use cones or other field markers for regulation goals when using smaller fields (or if goals are not available).

Care and Maintenance of Facilities and Equipment

Facilities

1. Playing areas must be kept free of obstructions such as football and soccer goalposts, bleachers, sideline benches, and drainage grates.
2. Remove loose impediments such as rocks, sticks, and broken glass.
3. Goal cages (if used) must be assembled properly and anchored to the ground.
4. Adjacent fields must be separated by open space to avoid an overlap of activity from field to field.
5. Sidelines and goal lines must be marked with field white and/or cones.
6. A scoring circle must be marked in front of each goal or the activity modified to eliminate these areas.
7. Provide space for nonparticipants that prevents interference with class activities.
8. Provide easy access for emergency first aid personnel.

Equipment

1. Select sticks of a proper length for each individual student (26"–36").
2. Provide plastic (to be worn inside the sock) or canvas and cane shin guards for every student.
3. Provide protective equipment for the goalie if that position is designated during class play: leg guards, kickers, chest protector, and helmet or face mask.
4. Apply linseed oil to cleaned and sanded sticks to prevent drying and cracking during storage. Discard sticks that are splintered and cracked.
5. Clean or paint hockey balls (white) periodically for better visibility. Discard cracked hockey balls.
6. Replace torn or frayed grips on sticks.
7. Provide cones or corner markers for designated playing areas. Boundaries for available playing space must be marked and visible to all participants.

12

Flag Football

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The popularity of the game of football is reflected not only by the attendance at high school, college, and professional games, but also by its frequent appearance in the physical education curriculum. Although in physical education classes the game appears in a modified version, such as flag football, the skills and strategies inherent in football, exclusive of physical contact, apply equally to flag football.

Prior to participation in this activity, it is imperative that students differentiate between the game as played with protective equipment and that played with flags. Further, since some aspect of the game can appear from the elementary level through the senior high school level, it is critical that the students are kept in mind when designing the unit and lesson plans. When the activity classes are coeducational this must also be a consideration for selecting and programming skills, progressions, drills, lead-up games, and the regulation game.

The attention to appropriate equipment must also be deliberate. The size, weight, and composition of the football will vary from the modified equipment appropriate for the elementary level to the regulation football appropriate for the high school student.

Because students may be unaware of or ignore the potential for injury in this activity, it is imperative that a safe learning and playing environment be maintained. Although the correct execution of the activity skills and their application in practice or game play is a priority, enforcement of the rules of the game is of the utmost importance. Inconsistency in officiating and rule interpretation or enforcement, particularly with the noncontact rules, has the po-

tential to contribute to a wide range of injuries. Supervision must be of the highest quality.

The impact that daily use and the weather have on the activity area must also be taken into consideration. An inspection of the playing field to determine its suitability for class must be regularly scheduled. Bare spots, rocks, holes, glass, and obstructions near boundaries are hazards to safe playing conditions and must be removed before approval for use is issued.

Although attention to each of the aforementioned is essential, perhaps the most important ingredient is the selection of a qualified and conscientious physical educator who is knowledgeable and qualified to teach the activity and who will devote the time and effort necessary to provide a safe and enjoyable experience for the students.

Conduct of Activity

Prior to designing a unit for flag football, it is essential to identify the skill and ability level of the students for whom the unit is planned. This is a consideration that must be dealt with not only in the preparation of the unit plan, but with each daily lesson plan as well. The important question to ask is: "Do these students possess the skill necessary to allow them to safely and successfully participate in this lesson?"

The following checklist will assist in the development of a safe and successful plan.

1. Assess the abilities of the class. Do they possess the skill level to allow them to participate in the day's activity?
2. Assess the physical attributes of the class. Organize the assignment of participants for equitable practice and competition. Do not permit unequal competition.
3. Develop your unit plan and lesson plans with cognitive, psychomotor, and affective objectives.
4. Develop content appropriate for the age and skill level of the participants.
5. Stress fundamental skills prior to competitive activities. Do not progress until fundamentals have been acquired.
6. Prepare the class physically—provide proper and adequate warm-ups.
7. Organize practice activities so all directional flow is similar. (Example: all students throwing in the same direction.)
8. Allow adequate distance between drill groups when accuracy and execution may not be consistent. (Example: punting.)
9. Consider the direction of the wind in drills when the ball will be thrown and kicked.

10. Be aware of the location of the sun in drills involving catching and tracking the football.
11. Emphasize to students the rules interpretation for the day's activity.
12. Demonstrate, describe, and teach the correct skill technique and provide feedback to the students regarding their execution.
13. Remind students of boundaries and limitations of the drill, lead-up, or regulation game.
14. Review your expectations for the lesson.
15. Emphasize the lesson experience and not the outcome of the game.

To help develop and organize a unit or lesson plan, prepare a chart of class ability levels, like the one shown in Figure 1. The three levels can be interpreted as beginning, intermediate, and advanced skill or knowledge. The use of such a chart for each activity class should enable you to evaluate the class and modify your lessons accordingly.

Supervision

The importance of proper supervision cannot be overemphasized, particularly with an activity such as flag football. To ensure the needed supervision for the lesson, the physical educator must be well organized and prepared. The following checklist will assist the planning and preparation of the lesson with particular emphasis on supervision.

1. Specify the area where the class should meet.
2. Establish a procedure for dispensing equipment.
3. Organize the warm-ups, drills, lead-ups, etc., so all the activity will be within your field of vision.
4. Establish a pattern of rotation so instruction and specific supervision can take place without hindering your vision of other activity areas.
5. Determine if the student behavior in the activity is what you had intended and initiate corrective action where appropriate.
6. Establish specific rules of safety and acceptable behavior. Immediately correct an unsafe situation.
7. Assign only competent student officials who have successfully completed an officiating clinic or workshop. Observe and evaluate their performance.
8. Observe the officiating and correct any interpretation or enforcement of the rules.
9. Specify a procedure for dismissal. Check to see that the area has been vacated by all students.

CLASS ABILITY RECORDS

Class (Grade & Period) _____

Number of students: Female _____ Male _____

Overall Ability Level: I _____ , II _____ , III _____

Skills/Knowledges	*Level*			
	I	II	III	Safety Rules
1. Rules				
2. Body Control				
3. Blocking/Screening				
4. Passing				
5. Receiving				
6. Place Kicking				
7. Punting				
8. Centering				
9. Tagging				
10. Lead-ups				
11. Ball Carrying				
12. Ball Handling				
13. Regulation Game				
14. Team Offense				
15. Team Defense				

Skill Exceptions: (List students of extreme levels of skill)

High	*Low*
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Figure 1. Form to Record Class Ability Levels for Reference

Environmental Safety Conditions

Prior to any activity, a procedure must be established for inspection, maintenance, and reporting of hazards. Inspection should occur on a regular basis and any reported hazard must be attended to before granting permission for resumption of the use of the facility or equipment.

The following checklists will assist in the inspection of the facility, the equipment, and proper activity attire.

Equipment Checklist

1. Inspect the condition of the flags and belts; make repairs or replace when necessary.
2. Inspect the condition of the footballs.
3. Order a variety of sizes and types of footballs to accommodate the various levels of ability.
4. Inspect all markers and determine whether they are safe for the activity.
5. Gather and place unused equipment off the field of play and a safe distance from the activity area.
6. Collect all equipment at the conclusion of the class and store it in a secure place.

Facility Checklist

1. Inspect the fields for holes, glass, poles, stones, sprinklers, and obstructions.
2. Inspect the turf for suitability of play.
3. Lay out adjacent fields with enough space between fields to minimize the potential for collision between participants on neighboring activity areas.

Participant Checklist

1. Check for proper footwear. Do not allow metal cleats.
2. Check for students wearing glasses and provide appropriate glass guards.
3. Stress the rules governing play for the day's activity. Reinforce the noncontact rule.
4. Assign appropriate stretching exercises for the weather conditions and the activity to be presented.
5. Establish a procedure for the reporting and treatment of injuries sustained in the activity.

13

Floor Hockey

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The game of floor hockey is a popular activity in school physical education and intramural programs. For many students, it is a novel activity, particularly for those who live in areas where ice hockey is uncommon.

It is extremely important that careful planning goes into the development of a floor hockey unit in a physical education program. Because many students lack prior hockey experience when first introduced to floor hockey, it is critical that stick and puck control be taught in an effective manner. Furthermore, since floor hockey is not a body contact sport as is ice hockey, constant physical control is an important safety factor.

When the teaching of floor hockey is carefully planned and conducted, students are able to master the skills necessary to be successful in playing the game and can participate in a safe and enjoyable manner.

Common Injuries

Research related to the playing of floor hockey in elementary, junior high, and high school physical education and intramural programs has determined the various types of injuries that can occur to participants (Gray, 1991). In floor hockey, as in other physical activities, almost any type of injury could occur to almost any specific part of the body. However, research data show that three major categories of injuries are most prevalent.

The category of injuries most common to floor hockey, as reported by teachers, are scrapes, bruises, and/or cuts on the extremities, such as the knees, shins, ankles, feet, hands, wrists, and arms, as the result of being struck by a floor hockey stick. Contact between a stick and another player's extremities result from two main causes. The first, and one that should be earnestly prevented by teachers, is high sticking. Teachers should strive to have all students consistently keep their sticks below waist level. High sticking is most common during the follow-through phase of a shot. Students must be taught that when another player is within close proximity even a waist high follow-through could cause serious injury. The second cause of injuries to the extremities is due to the stick following through too long when the shooter is closely guarded by another player(s). Even if the stick is kept low, a long follow-through could result in contact with the opponent's feet and/or ankles.

The second category of injuries identified by teachers involves those resulting from being hit by a stick or puck in the head area, including the face, eyes, mouth, and nose. Here again, it must be stressed that the stick should be kept low at all times. Also, players should be taught to keep all shots either on or close to the floor.

The third category is injuries caused by collisions between players. These collisions can result from illegal acts of body checking and other acts of aggression as well as poor control of the body when stick handling, attempting to take the puck from an opponent, and other similar situations.

The following guidelines concerning supervision, selection and conduct of the activity, and environmental conditions can assist teachers and supervisors in successfully managing the risks related to the game of floor hockey.

Supervision

1. Provide an adequate number of supervisors who are familiar with the game of floor hockey and who know what to look for in attempting to prevent injuries. The number of supervisors needed may vary based on the circumstances present in any given situation, such as the age and maturity of students, previous floor hockey experience, ability levels, amount of equipment, size of playing facility, etc.
2. Maintain visual contact with the students being supervised. The supervisor should not allow his or her attention to be diverted. This is particularly important when students are practicing shooting drills where several sticks and pucks might be active at any one time.
3. Maintain a position of immediate accessibility to all students and inform students to locate the teacher/supervisor any time assistance is needed.

4. Develop and consistently enforce all necessary safety rules. These rules are designed to prevent injury but cannot do so unless enforced. Be sure to post and explain the rules to students and answer any questions they might have regarding them. Students are often very helpful in formulating important safety rules and are usually quite willing to offer their input if given the chance
5. Stop all unsafe acts immediately. Certainly it is preferred that unsafe acts never occur, but if they do, immediately curtail them before an injury occurs. Be constantly alert to activities that could develop into dangerous situations if not stopped. Be especially alert for inadvertent high sticking. The teacher/supervisor should observe the students as they practice floor hockey drills and play floor hockey games; stop dangerous acts that could lead to foreseeable injuries; and explain to students why it is important not to repeat the unsafe act.
6. If more than one supervisor is deemed necessary, spread out in logical formation with overlapping fields of vision. If only one supervisor is present, remain near the most "dangerous" locations to provide specific supervision while still providing general supervision to the rest of the group. For instance, one might position himself/herself near a shooting drill while other students are working at other stations, such as stick handling, passing, etc. If the use of stations presents a supervisory problem to a given teacher, it might be that all students will simply have to participate together in the same drill.
7. Inform students of the risks inherent in the game of floor hockey and what to do to avoid injury from those risks. Give specific examples and demonstrations of situations of particular concern. For example, demonstrate what might happen as the result of a high stick follow-through after a shot. Then show students how to properly and safely complete that follow-through with the stick in a low position. Discuss in detail the rules prohibiting body checking, cross checking, tripping, etc.
8. The supervisor should always maintain control over the students. Discipline where necessary so that a potentially dangerous situation does not turn into an injury-causing one. Develop "withitness." Be constantly aware of what is going on within the area of supervision. "Lifeguard" the group of students as would a lifeguard at a public beach. Supervise actively by being mentally and physically alert and active. One cannot supervise in a passive manner merely by virtue of his or her physical presence alone.
9. Attempt to anticipate the acts of students before they occur, especially when an accident appears "ready" to happen. Be particularly concerned about rowdy behavior that might lead to body contact or dangerous use of the sticks. Although a teacher might not be expected to prevent a sudden,

spontaneous outburst by a student, the teacher is expected to prevent reasonable foreseeable occurrences.

10. Complete a well-designed injury report form or determine that one is completed by an authorized person. Be certain that the information recorded is factual and is recorded as it was reported to the individual in charge. Obtain enough information regarding the injury to be useful. Study the injury report forms on a regular basis to search for patterns in the nature of injuries sustained by students as the result of playing floor hockey.
11. Constantly observe the students' floor hockey play patterns and tendencies to note areas of concern. Discuss these concerns with other staff members and suggest changes, modifications, or improvements to decrease the likelihood of injury and to increase the likelihood of success in acquiring floor hockey skills.
12. Strive to develop a safety-conscious attitude among the students. Discuss with the students their responsibilities with regard to personal safety and the safety of others. Develop an environment where students will feel accountable for their own actions.

Selection and Conduct of the Activity

1. Follow the local administrative process to have floor hockey formally adopted as part of the school district's physical education curriculum. This will increase the likelihood that the planning related to scope and sequence concerns has been thoroughly discussed and resolved by a curriculum committee comprised of individuals familiar with the game of floor hockey.
2. Continue the written planning process with carefully prepared unit and lesson plans. Pay particular attention to the appropriate sequencing of skills from the beginning through the more advanced skills using sound and well-paced progressions. The time spent in careful, written planning will pay off in the long run with safer and more successful lessons. Be certain that lower level skills that serve as prerequisites to higher level skills are mastered prior to moving on.
3. Always be certain that the skills presented to the students are within their physical abilities. If students are asked to execute advanced skills or maneuvers that are beyond their abilities, injuries could result.
4. Teach students the skills that are necessary to play floor hockey in a safe and reasonable manner. Merely explaining the general concept of the game prior to full competition is an invitation for unnecessary injuries to occur. As students practice floor hockey skills, the teacher will have opportunities to step in and make technique corrections that will not only increase

the students' likelihood of successful skill execution but also decrease the likelihood of injuries related to incorrect execution. To do this, the teacher will need to know floor hockey skills, particularly those pertaining to use of the stick, and be able to communicate proper execution of these skills to the students.

5. To the extent that it is reasonable and feasible, instruction should be individualized. All students do not learn in the same way or at the same rate so teachers must be sensitive to individualized learning needs. A particular floor hockey skill that is acquired quite quickly by one student might take considerably more time for another student to master.
6. Plan warm-up and cool-down activities that are designed specifically with the class period's activities in mind.
7. Be certain students understand that floor hockey is a noncontact sport, quite unlike ice hockey. Although the basic concept of the game is similar in that students attempt to score goals by shooting a puck into a net by use of a hockey stick, there is no similarity whatsoever in the nature of body contact. This fact must be clearly explained to students and it must be consistently enforced. Students should be taught to keep their bodies under control at all times so as to avoid collisions. Stress that all students who have the potential to collide in a given situation have equal responsibilities to avoid that collision. One cannot simply assume that the opponent will stop. It is important to stress this when teaching stick handling. Simply because a student is progressing down the floor with the puck does not mean that he or she can proceed in any direction whatsoever. If an opponent is in close proximity to the student who has control of the puck, the student with the puck must share the responsibility of avoiding a collision with the approaching defender.
8. Teachers need to stress the major importance of stick control. Students must be taught how to safely shoot and pass the puck. This includes proper back swing, puck contact, and follow-through. The most troublesome of the components of proper shooting and passing in floor hockey is the follow-through. It is absolutely critical that the stick be kept low after contact with the puck. Students who follow through with their sticks unnecessarily high pose a great hazard to opponents in close proximity. Students, particularly beginners, need to be frequently reminded of three points as part of a safe follow-through: (1) follow through with the stick forward rather than up, (2) follow through with the stick short rather than long, and (3) rotate the wrists to turn the blade of the stick down rather than up. Although these three components should decrease the danger posed by the follow through motion of a floor hockey stick, students must still be reminded that when either opponents or teammates are very close, they must maintain control of the stick so as to prevent it from hitting the nearby

player — even though this might restrict a follow-through that could be safely executed when another player is not in the vicinity.

9. Stress to students the importance of keeping the puck either on the floor or low to the floor during shooting and passing. Teach students proper puck control so that the puck is not flying around the gymnasium near head height. A high flying puck poses a danger to opponents and teammates alike, but it is also difficult to gain control over a puck when it is off the floor. The puck should be passed on the floor where a teammate can successfully receive it. Likewise, shots on goal should remain either on or very close to the floor. High pucks will simply fly over the goal.
10. Students should be taught that when attempting to take the puck away from an opponent, they should not lean forward and thereby drop their heads toward the opponent's stick. This could result in the student being hit in the face with the stick or puck. Instead of leaning in, students should be taught to remain upright and attempt to dislodge the puck by proper use of their sticks.

Environmental Conditions

Equipment

1. Look for signs of wear and tear on the floor hockey equipment and report needed repairs in writing. Some minor repairs can be performed immediately by the teacher. Be certain to inspect floor hockey sticks prior to each use. Be diligent in removing damaged sticks from use.
2. Perform preventive as well as corrective maintenance. If a stick or other piece of equipment shows signs of wear, repair it before its condition worsens and, perhaps, causes an injury. Never allow students to use damaged or questionable equipment.
3. Do not allow students to abuse the floor hockey equipment or use it in a manner for which it was not intended. Such treatment will not only shorten the life of the equipment but could also lead to injuries.
4. Provide students with equipment that is designed appropriately for their various ages and developmental levels. For example, providing young children with floor hockey sticks that are too long or too heavy might lead to problems related to adequate control.
5. Provide students with protective eye guards and mouth guards, which could be instrumental in preventing injuries caused by a high stick or errant puck. Although students should be taught how to maintain constant control of their sticks and the puck, at one time or another a stick or puck might go dangerously high.

6. Provide students with field hockey protective shin guards or shin guards worn inside the socks, to help prevent injuries to the lower legs caused by contact with the opponent's stick. Shin guards also help to protect against bruises caused by the puck hitting students' lower legs.
7. Provide goalies with protective face gear, preferably a full face mask, to protect their face, mouth, and eyes from the puck and from sticks that might be carelessly raised when near the goal.
8. Use either the specially-designed low bounce floor hockey ball or the light, hollow puck that comes with most sets of floor hockey sticks. Do not use a heavy, weighted puck or an ice hockey puck. Some teachers even prefer to use a small foam ball.
9. Secure all floor hockey equipment when it is not being used in a supervised situation.
10. Teach students to perform safety checks on their floor hockey sticks and require them to do so prior to each class.

Facility

1. Be alert to relevant environmental conditions that might affect safe participation in the game of floor hockey. The gymnasium floor should be clean and dry to prevent unnecessary slippage by students who are making fast movements and sudden changes of direction.
2. Pay particular attention to obstacles on the floor or the gymnasium walls. Usually the game is played using all floor space inside the four gymnasium walls. Passing the puck off the walls is a common maneuver to elude opponents. However, if floor or wall obstacles or protrusions exist, the teacher might need to restrict the use of available floor space similar to the confines of a basketball court. In this situation, there would be a buffer zone between the area of play and obstacles or protrusions that might pose a hazard to students. This would eliminate the use of the walls in passing the puck but would be necessary to prevent injuries related to collisions with the obstacles or protrusions. If this modification is employed, the teacher could either have a faceoff near where the puck goes outside the floor of play or simply allow the nonoffending team to put the puck back into play as is done in the game of basketball.
3. Do not allow too many students on the floor at any one time. Remember that the movement of students in the gymnasium along with the use of sticks and pucks requires that students have ample room to maneuver. Depending upon the number of students in the class, the teacher might need to have students take turns practicing the drills as well as take turns in playing the game itself. It is not recommended to exceed the regulation six players per team on the floor at any one time during actual competi-

tion. Rather than crowd the floor with an excessive number of players, teachers should substitute players when play is stopped or at predetermined time intervals.

4. Students should be grouped and spaced appropriately when practicing floor hockey drills. Make maximum use of the existing facility but do not overcrowd it during skill practice.
5. If two or more floor hockey games are played in close proximity (e.g., two games played across the width of the gymnasium, one at either end), care should be taken to provide an appropriate buffer zone between the adjacent areas. Since players might leave their respective areas, this buffer zone is important to prevent collisions with players on adjacent floor spaces. It is also helpful to use a barrier (e.g., a dividing curtain) to prevent the puck from leaving one area of play and entering an adjacent area of play. Use of an opaque curtain, however, would require additional supervisors to guarantee the ability to maintain visual contact with all players.
6. The goalie crease should be clearly marked with tape on the floor in front of each goal to identify the area where opponents may not enter and thus interfere with the goalie's movements near the goal.
7. Students who are waiting to enter the game should be placed outside the area of play where they can be adequately supervised but do not pose a collision hazard to players in the game.

Floor hockey is a reasonably safe physical activity as long as certain guidelines are followed. If teachers carefully plan the use of their instructional time for the successful learning of floor hockey skills, carefully supervise the activity with particular attention paid to stick control, puck control, and body control, and provide adequate floor hockey equipment and a safe facility, then students can enjoy and benefit from their participation in this exciting game. Careful planning and structured control of the activity make a real difference not only in the students' enjoyment of the game but also in their safe participation.

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14

Games

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Educators have found that games can be a very valuable instructional tool. Commonly accepted education objectives that can be fostered through the use of games include: developing and enhancing skills, building community feeling and developing teamwork, and generating student interest. Moreover, because of their universal appeal, games tend to be popular with students and faculty alike. In every school, there are numerous games which the children know well and enjoy playing at practically any opportunity. Such games usually require a minimum of organization and equipment and can be initiated on a moment's notice. They are so well known that little or no thought or effort is required for their implementation. Games of their type are frequently used as spur-of-the-moment activities or "fillers" when a planned lesson concludes before the completion of the instructional period.

It is important to recognize that the universality and the simplicity of games is, at one and the same time, an educational advantage and a source of great danger. Quite simply, games are too easily taken for granted. Too often they are implemented without thorough planning and/or conducted without adequate supervision. Under such circumstances they can and will degenerate into situations that can predictably lead to needless injuries and, thus, to lawsuits.

In a study of 175 lawsuits brought against instructional programs, games were the second most frequent source of litigation.[1] Only gymnastics resulted in a greater number of lawsuits. Activities such as touch or flag football, bas-

1. Dougherty, N.J. (1988). Learning from the mistakes of others, *Athletic Business*, 12(8), 59.

ketball, floor hockey, and wrestling, which are generally recognized as carrying a high risk of injury, were well behind in the number of lawsuits that they generated.

The lawsuits involving games were fairly evenly divided in terms of the specific nature of the alleged negligence. Several involved inadequate supervision, especially with regard to rough play; others focused on unsafe environmental conditions, with common concern for the quality of the playing surface and the availability of buffer zones; and still others claimed the specific game or activity in question was inappropriate for the individuals involved.

The following guidelines are designed to assist the teacher in the development of safe and productive game activities.

Supervision

1. Organize the group so that all students are within your field of vision.
2. Maintain supervisory locations and movement patterns that allow you to keep visual contact with the entire group. Simultaneously supervising more than one game is not, in and of itself, improper. However, failing to maintain appropriate general supervision over some portion of the group can lead to serous problems.
3. Do not play the game with the students. It is virtually impossible to concentrate on playing and effectively supervise the entire group. The risk, in this situation, is twofold. Someone may be injured because you failed to notice and correct a dangerous situation. But also, someone may be injured because you constitute a significant physical presence within the playing area and are not fully concentrating on your movements and interactions. You become, in essence, a collision hazard and a mismatched one at that!
4. Establish and regularly enforce game and safety rules. Remember that rules which go unenforced simply cease to exist. Students need frequent reminders of the nature and importance of the rules as well as the recognition of faithful enforcement.
5. Establish emergency signals which will result in immediate cessation of play and student attention. A loud whistle, for instance, can be an invaluable safety tool when a dangerous situation is detected, especially in the midst of a relatively loud and active game.
6. Maintain careful surveillance and control with regard to the emotional level and attitude of the class. A game that is allowed to become too cutthroat, or where the attitude has shifted from a healthy desire to win to a less acceptable goal of "beating" one's opponent, is a likely source of rule violations and injuries and must be controlled.

Selection and Conduct of the Activities

1. Remember that readiness is a function of skill ability and preparation. The teacher must ascertain the readiness of all students before initiating a new activity.
2. Careful record keeping is a valuable method of tracking student development and readiness as well as establishing documentary proof of your efforts. Lesson plans, skill testing results, and curriculum guides have great value as educational tools and as legal defenses.
3. Be sure to provide accurate detailed instructions that are fully understood by the students. Both verbal instructions and demonstrations are essential. More complex games may need to be broken into smaller elements for easier understanding. A slow-speed walkthrough is an excellent method of reinforcing and assessing student understanding.
4. Beware of mismatch situations in games requiring physical contact. Organize contact activities to reduce hazards caused by large differences in the size, skill, and/or ability of participants.
5. Select and modify games to best suit the needs and abilities of the participants. While modifying the manner in which a given game is conducted can be a very valuable and appropriate technique, it should never be done without careful thought and planning. All modifications should be clearly justifiable within the educational objectives of the program and should reflect careful consideration for safety factors.
6. Warn students of any and all risks inherent in the game. Safety rules should be stated so as to clearly inform the players what behavior is expected or prohibited but also why the rule is important and the risks involved with noncompliance. This technique increases the students' level of awareness and the likelihood of their compliance.
7. Be sure that all participants are properly attired for the game being conducted. Too often teachers give in to the pressure exerted by enthusiastic but unprepared students and allow participation in inappropriate street shoes or, worse yet, in stocking feet. When a student is improperly attired and the clothing or shoes they are wearing places them or others at risk, participation must be prohibited. Similarly, the instructor should require the removal of jewelry and the use of safety equipment (e.g., eye guards, shin pads, etc) when necessary.
8. Beware of games which carry a high degree of risk while providing relatively little educational benefit. Often the same objectives can be achieved in much safer ways. Dodgeball type activities, for instance, when played with playground balls or volleyballs add nothing to the curriculum that could not be more safely achieved in other ways. Modifications such as

the use of foam or fleece balls, on the other hand, remove much of the risk while retaining the essential nature and outcomes of the game.

9. Invasive games (where teams intermingle, invading each other's territory in order to score) require special concern for avoiding collision. Early movement experiences stressing personal and general space provide excellent preparation for these activities. Periodic reinforcement and reminders regarding the risks and avoidance of collisions are necessary.

Environmental Conditions

1. The playing surface must be relatively smooth and free of hazards and obstacles. Holes,debris,dust, and slippery conditions due to water or other inappropriate substances are examples of hazards that can be easily discovered and avoided through an appropriate pre-use inspection of the playing area.
2. Be sure to allow sufficient open space around and between games for children and/or balls to go out of bounds without danger of collision with obstacles or other players.
3. Be sure that the equipment is appropriate for the activity as well as for the ability levels of the students. The use of a large cageball in a volleyball type activity, for instance, has on more than one occasion resulted in both unnecessary injuries and subsequent lawsuits.
4. Pay particular attention to traffic patterns within and among games. For example, relays should include provisions to ensure that all runners turn in the same direction and return on the same side of their team to avoid collisions with other runners. When more than one game is being conducted, the directions of the action in the various games should parallel one another as much as possible. This reduces the dangers associated with out-of-bounds players or balls from one game encroaching on the playing space of another.
5. Always provide ample stopping and turning space for running activities. Finish lines should never be close to a wall or other obstacle unless the game has been modified to preclude the possibility of overrunning the line or falling upon completion of the task. Similarly, it is dangerous to direct students to race across the gym, touch the wall, and return. Turning areas should allow ample space to safely change direction without collision with persons or objects.

15

Golf

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The nature of the game of golf invites potential safety hazards. Swinging an implement in excess of 90 mph in an attempt to propel a solid sphere 1.68 inches in diameter and weighing 1.62 ounces can be both exhilarating and dangerous. The manner in which the game is introduced and organized for instruction and practice can greatly reduce the danger and enhance the exhilaration.

The key to safety in golf is awareness. Awareness must be developed through three levels: the administration, the golf instructor, and the student. Each has a major responsibility in regard to safety considerations.

Administration. Golf is becoming more popular in physical education curricula and in recreational programs. However, the question of whether qualified personnel are on staff to supervise and/or instruct golf is rarely addressed by administrators. Often, an individual who plays golf is assigned to the activity with the assumption of instructional ability. This may be a faulty assumption and could lead to safety hazards.

The administration must determine if an individual is qualified to teach golf. If not, adequate time must be provided for training to ensure that technical, organizational, and safety skills are acquired.

If a person accepts the responsibility for teaching golf, he or she is acknowledging the preparation to do so. If the teacher does not feel prepared, additional training should be secured before assuming those responsibilities.

Another viable option is to employ one of the local professional golf association (PGA) teaching professionals to assist with a golf instructional unit. The PGA professionals are well qualified instructors, aware of the safety, and

dedicated to enhancing the game of golf in their communities. The practice of employing noncertified teachers and coaches to assist in sport and physical education programs has become acceptable in those situations where it is necessary in order to meet the instructional needs of the programs.

Golf instructor. The greatest responsibility for safety awareness resides with the instructor. Readiness to instruct requires the technical knowledge to ensure the understanding and development of efficient and effective swing mechanics; organizational knowledge for safe student practice and movement in the instructional and practice area; and understanding of individual needs and contraindications for golf drills and techniques; knowledge of the selection and care of equipment; knowledge of appropriate procedures for the care and maintenance of facilities; and informing the students of the inherent dangers of the sport (see Figure 1). Constant awareness of the safety issues in each of these areas is needed, regardless of how much or how little experience an individual has had in golf instruction.

Students. Students are the third link in safety. They should be made aware of safety concerns and required to assume a major role for their personal safety and the safety of others while in a golf class. This is critical if safety is to be practiced when students are on their own during actual course play.

Common Injuries in Golf

The potential for injuries during golf instruction is far greater than the actual severity of most injuries which occur. The most common minor injury in golf classes is blisters. These are caused by excessive movement of the club in the hands. A faulty grip or improper grip size is usually the problem. Both can be remedied by awareness of individual hand size and grip technique relative to the size and condition of the club grip. Another recommendation to combat blisters is to insist that students wear a golf glove on their target-side hand (e.g., right-handed players wear a glove on their left hand).

The less frequent and more serious injuries occur when individuals are hit by a club or golf ball. Being hit by a club usually occurs when an individual walks into the path of a swinging club. Such injuries can be avoided by establishing and enforcing rules which govern where and when a club may be swung. Each instructional area should have designated areas for student movement in the instructional/practice environment and hitting field.

Injuries due to golf balls occur more frequently on golf courses with parallel fairways than in physical education or recreational golf classes. In fact, they should never occur during instruction if appropriate safety rules are followed. This is especially true if individuals are properly instructed never to retrieve balls prior to a designated signal by the instructor. Walking in front of

Department of Physical Education
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GOLF RISK FORM

The purpose of this form is to inform you of the injury potential of participation in a golf class/lesson. Although golf would be classified as a relatively "low risk" sport in regards to serious injury or fatality rate, serious injuries and deaths have resulted from participation in golf. In order to make the golf class/lesson as safe as possible for all participants, your cooperation is requested. Know and observe the basic rules of safety for golf. Please read the following safety rules before participating in a golf class/lesson.

Golf Safety Rules

1. Before you swing any club, check to see that no one is within range of your swing.
2. When someone swings a club, be careful where you stand or walk. Stay well out of range of any swing.
3. You should swing a club so that your follow-through is directed toward an open area. It is not likely to happen, but the club could break or slip out of your hands.
4. You should allow a player taking a swing plenty of room. Similarly, when you are swinging a club, be sure to have plenty of "space."
5. Before playing any stroke on the course, make certain the group ahead of you is out of range of your intended shot.
6. If you hit a ball that is traveling toward someone and may endanger that person, call "FORE" loudly to alert the endangered player.
7. Stay on the tee at the practice range. Walking ahead of the teeing ground to retrieve balls or tees is very dangerous and is prohibited at most driving ranges.
8. When you are teaching/observing someone, stand facing the person or behind the player, looking down the intended target line.
9. Lightning storms are extremely dangerous to golfers on the course. When such storms occur, the best precaution is to GET OFF THE COURSE. If that is not possible, seek shelter away from your golf clubs and big trees.
10. If you use an electric cart to drive around the course, drive with care and stay on the cart path.

I HAVE READ THE ABOVE SAFETY RULES AND UNDERSTAND THAT THERE IS A RISK OF SERIOUS INJURY IN PARTICIPATING IN GOLF.

_____ signature

_____ date

Figure 1. Sample golf risk form

the designated area or into the hitting field should never be allowed while anyone else is swinging a club.

Conduct of the Activity

Student Information Sheets

Information about students is important for establishing a safe and effective environment. The following types of information are particularly beneficial for golf instruction.

1. Experiences in golf
   - grouping by ability
   - selection of peer teachers aides
   - determination of starting level
2. Disabling conditions
   - potential equipment and technique modifications
   - contraindications of specific drills
3. Allergies
   - awareness to potential allergic reaction
   - medication side effects

Progressions

Skill progressions in golf are not always based on safety considerations as in gymnastics or swimming. The progression selected is determined by instructor preference with regard to beginning with the long game and progressing to the short game, or the reverse. No specific progression has been supported by research as being more effective in skill development. Safety, however, must be instilled in the organizational structure and instruction regardless of the selected progression.

Drills

Golf drills greatly enhance the learning process and are beneficial for group instruction. There are, however, drills which are contraindicated for particular individuals due to pre-existing conditions such as back problems, shoulder or knee dislocations, and arthritis.

As an instructor, it is important to be aware of the potential good or harm specific drills may cause. Drills should be explained clearly, demonstrated correctly, and used appropriately. Figure 2(a) is an example of the "one-legged" drill which has become popular for helping students develop an arm swing.

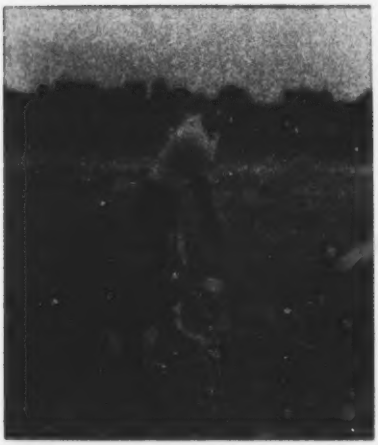

Figure 2(a). Proper position for one-legged drill.

Figure 2(b). Potentially unsafe modification of one-legged drill.

Note the position of the rear foot placed up on the toe. This allows the lower back to be free of tension. Figure 2(b) is a dangerous position. It shows a modification of the basic drill which has caused back problems to occur in people with no previous history of back trouble. Such positions may also exacerbate or irritate already existing problems, or back weakness.

The use of the student information sheets is a valuable tool in the selection and omission of drills when problems are noted. Know your students and the drills you select.

Safety awareness should begin as the activity is introduced. Similarities and differences relative to safety and equipment in other activities need to be stressed. The length of the club, subsequent differences in the space required to swing, and the potential speed of the swing should be noted and compared visually and verbally by demonstration with bats, tennis rackets, and/or other implements familiar to the students.

Rules should be established to help the students become familiar with their responsibility in promoting the safety of the game for themselves and others. It is important to relate the rules for your class activity to specific implications at a driving range, golf course, or practice in the park or backyard. The safety rules should specify where, when and the direction in which clubs can be swung and balls hit. Once set, the rules should be strictly followed.

Table 1 is an example of a rules format that may be used in your classes. The note insertions are clarifications provided for instructors, and are not for inclusion in the handouts.

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Table 1
Examples of Safety Rules in Golf

Where	Clubs may be swung and balls hit only in the designated area. *Note*: Designated areas should be clearly delineated with visual markers, and verbally described to students.
When	Clubs may be swung and balls hit only when indicated by the instructor. Balls are to retrieved only when indicated. *Note*: The "when indicated" should be an established signal such as a whistle or verbal command.
Direction	Clubs are to be swung and balls hit toward the designated target(s) only. *Note*: Targets should be set toward which balls must be hit. They should be placed toward the center of the hitting area and at a variety of distances to accommodate for swing lengths.

Copies of the rules should be dated and distributed to each student as well as posted in areas which are clearly visible to the students. Computer graphics and attractive posters can enhance the visibility of the rules and provide subliminal reinforcement. When laminated, the signs can be used for both inside and outside activity areas.

Environmental Conditions

Golf can be taught effectively in a gym or on a playing field. Larger areas are more conducive to safety because students can be provided more space in established hitting areas and stations. Anytime space becomes restrictive or less than three yards of space is allowed for a swing station, safety becomes a problem.

Indoor Playing Areas

The designated swing stations should be marked and safety rules clearly posted. The swing stations should be free of extra clubs, bags, or ball baskets.

Mats. Brush mats with rubber mat supports should be used when possible for safety. The brush mat provides a thick protective hitting surface (particularly for beginners) while the rubber mat creates a nonslippery surface for stance and brush support.

Full swing stations in which plastic or rubber balls are hit against walls should be placed away from doorways and a minimum of 7 to 8 yards from the wall. There should be a minimum of 3 yards between stations (see Figure 3). This allows ample room for the plastic or rubber ball to bounce off the wall and roll safely back toward the mats. If the mats are placed too close to the wall, students may become swing-shy, feeling too cramped.

The physical arrangement of the stations should be checked frequently during class, and between classes. It is particularly important to check the distance between stations, and be sure to maintain the 3 yard minimum.

Traffic flow. Traffic flow needs to be considered in the gym, particularly when various stations are implemented. Designated pathways can be marked using cones, jump ropes, chairs, brooms, etc.

Changing stations should be done on a signal and in a single direction. This systematic procedure, under the control of the instructor, helps to assure safety of movement. Once the change is complete, activity should be allowed only on a signal from the instructor.

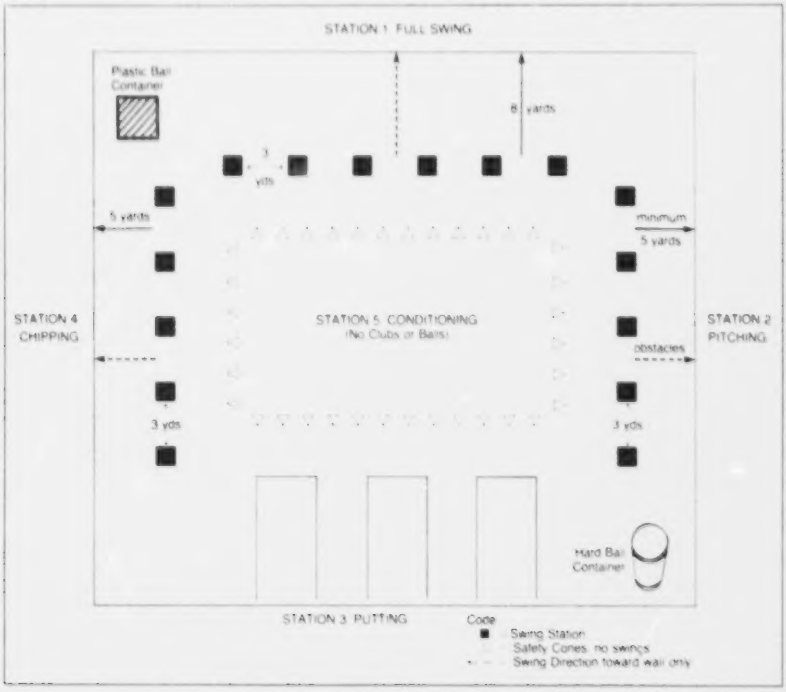

Figure 3. Illustration of a safe indoor practice area.

Stations. The swing stations should be marked clearly as putting, chipping, and full swing. This will help the student understand the proper swing length in the given area. For example, a full swing should not be made in the putting or chipping areas. It should be indicated that this is also true when practicing at a golf course. Each area should be checked frequently to assure that the stations are the proper distance apart.

Balls. When using plastic or rubber balls for swing practice and hard balls for putting, the containers need to be clearly marked. It would also be helpful to have different colored balls (e.g., blue stripe on hard balls and red stripe on rubber balls). The plastic ball container should be carefully checked before each class to assure that hard balls have not been mixed in. Students should be made aware of the differences and instructed to check each ball for type prior to hitting. It is easy for a beginner to become engrossed and not be aware of the ball he or she is about to hit.

Dress. Loose fitting clothing and tennis shoes should be required. Tight clothing can be uncomfortable as well as restrictive in the swing. Street shoes are unsafe in that they lack support and are sometimes slick on the floor.

Cleaning up. The area indoors in which students are practicing should be clean and neat. It should be dust mopped each day, and preferably between each class. Brush mats and rubber mats create a dust film on the floor which can be hazardous to others using the gym.

Equipment. The clubs and balls should be collected at the end of each class and secured if the gym is left open or without supervision.

Outdoor Playing Areas

Hitting surface. Mats may or may not be used in outside hitting areas. A grass area is preferable to mats if at all possible. Grass provides the best learning environment and will assist in the direct transfer of the skills to the actual golf course. Whether mats or grass are used, the hitting surface should be free of rocks or any obstacles which could be hit accidentally.

Swing stations. Swing stations and the safety considerations discussed earlier are equally important outside. The open space may tend to give students a false sense of security. When students are not swinging or awaiting their turn, there should be an area designated in which they should stand or sit. This area should be away from the swing stations.

Balls used outside. As with indoor practice, plastic or rubber balls and hard balls should be separated and not used simultaneously at any one station. A hard ball hit accidentally in a confined area could be dangerous.

Hard balls are fun to hit; however, they need to be used with discretion when instructing the full swing. Adequate space, both length and width, is

needed to accommodate the novice who lacks control of distance and direction.

The grass space should be clear and cut close to the ground. This will help in finding golf balls. Balls which are not found can be hazardous to others using the field for activity classes and after school sports. The same is true when practicing in parks or other fields.

The total number of golf balls should be counted at the beginning and end of each class. Students should be instructed to count the number of balls they have before hitting and pick up as many balls as they hit. Students should pay particular attention to any misdirected shots (i.e., balls that go an unusual distance or direction) and be instructed to pick them up when it is time for all balls to be retrieved. This takes time, but is critical to the safety of others.

Most secondary education facilities do not have appropriate outdoor space for safe use of hard balls. Plastic balls can be stuffed with cloth or sponge rubber to produce a firmer feel and flight similar to the hard ball. An advantage of the plastic and rubber balls is that they require less time to retrieve since they can not be hit as far. They are also much safer—just be careful not to use tightly stuffed balls inside the gym if space is restricted.

Restrict the Area

When golf classes are in session, signs should be posted around the area. This is needed particularly in areas where the fields are used by community joggers or others as a thoroughfare.

Equipment

Appropriate equipment. Golf clubs should be purchased which vary in length, weight, and grip size. If the club is not appropriate for the learner, it can have a negative effect on the rate and progress of learning, as well as compromise safety. If you are not sure how to "size" clubs for a class, be sure to check with a local professional, or ask the golf club manufacturer for advice when ordering equipment.

Clubs which are at the extremes in weight or length for individuals affect their ability to swing the club effectively and efficiently. These extremes decrease the potential for success.

Grip sizes in the extremes can cause blisters. Sore hands from trying to maintain club control and "flying clubs" can both be the result of a grip which is too large or too small for the hand size. These are safety hazards which can easily be prevented, but not without awareness.

Maintenance of clubs. Three areas of a club should be checked for wear and damage: the grip, shaft, and hosel.

Grips which get worn or frayed can cause blisters and slippage in the hands. These should be checked and cleaned frequently. Composition grips are recommended for use in most classes because they are safer on the hands and easy to clean and replace (inexpensive). Grips should be cleaned with soap and water on a frequent schedule since they become slippery when dirty.

Clubs receive unavoidable wear and tear through extensive use. Shafts can bend as a result of hitting the ground repeatedly during swings, getting stepped on, or improper storage. They should be checked daily. If a shaft is bent it should be broken completely. A bent shaft is much weaker and if used, could snap in two. This is quite dangerous. Depending on the condition of the head, including the hosel, it can be used again by having it re-shafted. Otherwise, if it is too worn, it should be thrown out. If a shaft is only slightly bent, it can be straightened—just be sure to check it frequently.

The head of the club, where the shaft enters the hosel, receives tremendous abuse and may weaken over time. The club heads can snap without warning. Frequent checks are needed and often weaknesses can be detected by holding the head of the club and trying to turn the shaft. A squeaking sound indicates a potential weakness and it should be repaired (by a club repair expert) or destroyed.

Inspection. An equipment record should be kept. As golf equipment is received it should be numbered and the date noted. A written record should be established for a periodic inspection of all equipment. This is in addition to the daily inspection which should be noted in lesson plans or logs of activity sessions.

An ongoing record of equipment may provide information relative to the longevity of equipment purchased from various companies. Clubs which are inexpensive and therefore often attractive for purchase may not be as durable, or safe, when they receive excessive use. Equipment records may later be used to justify budgets when ordering a different quality club.

Students should be encouraged to help in checking and inspecting their golf clubs. Before hitting balls, all students should check their clubs. This aids in raising their awareness as to the care and maintenance of clubs and the importance of safety.

Summary

Safety issues in golf instruction are focused on developing awareness through classroom organization and instructional procedures. Awareness of safety in and beyond the school program is critical to the students themselves and oth-

ers. The teacher's task is to set the environment for learning and continued involvement beyond the school setting.

A sample golf safety checklist is provided as a tool for developing a safe golf program.

Golf Safety Review Checklist

Instructor

- previous instruction/training
- prepares golf risk form
- knowledge of:
  - group techniques
  - drills
  - selection/care of equipment
  - adaptation of facilities

Environmental Conditions

Rules

- rules handouts
- rules poster

Facility (indoor-outdoor)

- hitting surface cushioned/secured
- area free of obstacles
- traffic flow established/discussed
- stations minimum of 3 yards apart (check during activity)
- stations indoors minimum of 7 yards from wall and away from doors and hallways (check periodically during activity)
- warning signs posted around outside area if thoroughfare
- signal established for beginning and end of hitting

Equipment

- file established for periodic checks
- daily check for condition and repair of clubs
- storeroom and gym secured or locked between classes

Balls

- containers marked and separated for hard versus plastic and rubber balls
- check plastic/rubber ball container before each class
- instructor directs student to check balls before hitting
- count hard balls and rubber balls prior to hitting and after each class

16

Gymnastics

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There was a time when it was standard practice to ask performers to execute their floor exercise routines and tumbling runs on bare wooden floors. We cringe today thinking about the injuries that could have resulted from such a request, and undoubtedly look askance at the physical educator or coach who made those demands. We have to ask ourselves, however, if our smugness is well founded. Granted, we may not be making the same blatant mistakes that our predecessors did when they taught this activity, but are we certain that we have considered the element of participant risk from every perspective before we ask our students to become involved?

Logic leads us to believe that gymnastics is a high risk activity because participants who engage in the sport often find themselves moving through space in ways that are unfamiliar to them. In truth, when we examine the accidents that occur in this activity, we find that the element of risk is more closely associated with instructor performance, gymnasium conditions, and performer readiness than it is with the dangers inherent in any particular skill. This is an important observation for it helps us to recognize that the risks in gymnastics are usually a function of judgment, a factor that is well within our ability to control, rather than a function of the activity itself. It also helps us to realize that sound judgment is our best defense in cases of liability.

Given two instructors with equal knowledge of the mechanics of tumbling, the one who also possesses information on the potential hazards of the sport has a better chance of conducting an accident-free program. The reason is simple; if you are cognizant of the potential hazards, you can design strategies to avoid them. In the case of gymnastics, as in all sports, your risk man-

agement strategies should concentrate on the supervision you provide, the environment you create, and the degree to which you prepare your students to participate in the activity.

Supervision

Both general and specific supervision are important in every activity that is taught in the gymnasium. In the case of gymnastics, however, the need to form deliberate patterns of teacher behavior is of greater concern than in other activities because gymnastics generates a greater variety of individual responses. Placement of mats, student groupings, and the ability of each individual in the class to work independently are just a few of the elements that must be considered to ensure that the teacher's view of the class is not obstructed while giving individual attention to those who need it.

Following is a checklist that should be used when planning strategies to ensure adequate supervision. This includes guidelines for determining the quality and quantity of the supervision needed, the type of organization and control that is necessary, and the planning that must be done to avoid potential hazards.

Quality and Quantity of Supervision Needed

1. Supervision should only be provided by qualified instructors who have a thorough knowledge of:
   - mechanics of the sport
   - appropriate horizontal and vertical skill progressions
   - the most up-to-date teaching techniques
   - spotting techniques and the use of spotting equipment
   - care and maintenance of matting and safety equipment
   - principles of gymnasium layout
   - first aid and emergency procedures
   - general student characteristics (physiological, motorical, and emotional)
   - individual student readiness
2. Where possible, supervision should be provided by those who possess gymnastics safety certification or the equivalent achieved through in-house training programs.
3. Students should never perform without the aid of a spotter. Where appropriate, individuals in the class can be used to improve the performer/spotter ratio, but it should be remembered that students who assume spotting responsibilities are part of the supervision provided by the teacher. They

should, therefore, be specifically trained in proper spotting techniques and safety principles and periodically evaluated on their ability to perform effectively in this capacity.

Organization and Control

1. The gymnastics area must never be left unattended while an activity is in progress, even for only a few moments. A qualified instructor must be stationed in the area at all times. Note: Being in the equipment room, even though it is adjacent to the gymnasium, does not qualify as being present on the floor where the activity is being conducted.
2. The instructor should have the entire gymnastics area in view at all times. Even though assistance (direct supervision) is being given to a specific student, the instructor is not relieved of the responsibility for having everyone else in the class within view (general supervision). In other words, physical presence does not constitute supervision; knowledgeable and alert presence constitutes supervision.
3. The instructor should be in the area where the greatest need for assistance is anticipated. If a new skill is being taught to a small group within the class or if an individual is attempting a particularly difficult skill for his or her ability level, the instructor should be present to provide help.
4. Students should always have direct access to the instructor. They should know where to find him or her immediately and they should be taught to seek assistance whenever they are attempting something new or difficult.
5. Students should never have direct access to the gymnasium area; it should be locked whenever it is unsupervised.
6. Mats or apparatus should not be placed in an area where unsupervised students can gain access to them. The prudent person should assume that if mats are accessible and/or open they will be viewed as an invitation to participate.
7. Policies should be developed that explain the department's position on gymnasium security and the steps that are to be taken to ensure that an unsupervised area is never left open to the public. The procedures that emanate from this policy should include:
   - an explanation of who is responsible for opening and securing the area
   - the exact manner in which the area should be opened and secured
   - the times at which the area is to be opened and secured
   - the placement/condition of the equipment when the gymnasium is secured
8. Rules of conduct and safety should be posted in places throughout the gymnasium to serve as a constant reminder of the behavior that is ex-

pected. At the minimum the rules should include the following points regarding supervision:

- Without exception, no one is allowed in the gymnastics area unless an instructor is present.
- Gymnastics practice may not begin without the express permission of the instructor.
- All gymnastics skills must be performed on or over appropriate matting with appropriate supervision.
- Only teacher approved spotters may be used.

9. Care should be taken to use words that the participants can understand. The tone, although nonthreatening, should convey to the participant the serious intent of the message.
10. The safety rules should be reviewed with the student on a regular basis and time should be taken to explain why they are necessary and the type of injury that can result if they are ignored. As a general rule, the younger the student, the more frequently the instructor needs to present a formal reminder to the entire class.

Planning

1. Detailed lesson plans should be prepared for each instructional period. They should demonstrate, without a doubt, that the instructor has considered every aspect of the lesson and that he/she has made every effort to eliminate any potential hazards.
2. The lesson plan should explain the instructor's efforts to provide a well-supervised activity. At the very least, it should include information on:
   - apparatus and mat placement and how it relates to the instructor's ability to provide specific supervision while maintaining general supervision
   - placement of qualified spotters and their responsibilities as the secondary line of supervision
   - the efforts that are taken to make the students cognizant of the safety rules and the behavior that is expected of them
   - an explanation of the efforts that are made by the instructor to make him or herself readily available to the students
   - the steps that are taken to ensure the security of the gymnasium and equipment when they are not in use during a supervised class

Conduct of the Activity

Conduct of the activity refers to the selection and development of a program as it relates to the age, ability levels and readiness of the students, the type of instruction offered, the measures that are taken to ensure an individual's safety, and the warnings that are given so that individuals understand the inherent dangers of the skill they are about to try. Following are the guidelines that should be considered when planning for a gymnastics unit.

Participant Readiness

Participant readiness is a useful concept in gymnastics, especially as it relates to liability and risk management. Generally, "readiness" refers to the performer's potential for success when attempting a new skill or activity. If performers demonstrate the requisite elements necessary to perform a skill, we say that the potential for success is much higher than the potential for failure and that they are "ready" to move on in the progression. Level of readiness, therefore, can help us determine what is safe and what is hazardous for each individual in the class.

When we use the word readiness, more often than not, we are referring to the participant's level of motor ability. If the participants have the requisite movement vocabulary to perform a skill we are usually satisfied with their level of readiness and allow them to progress to the next level of difficulty. While this perspective is universally accepted, it presents problems in regard to gymnastics and liability.

The unique aspects of gymnastics require a carefully planned approach to safety. Gymnastics is one of the few activities in which the individual has little, if any, previous experience. This, in conjunction with the fact that gymnastics requires the student to move through space in ways that cannot be related to familiar activities, alerts us to other forms of readiness that must be tested before a student can be allowed to move on in the skill progression. In addition to ensuring motoric readiness, we must also ensure an appropriate level of psychological and physical readiness.

Attempting a new activity generates a certain amount of excitement, but it also generates a certain amount of fear, which must be dealt with if we are to ensure our students' safety. Fear of failure, fear of the unknown, and a lack of understanding about what may happen to us when we plunge head first into an activity for which we are unprepared are all elements of psychological readiness that must be addressed as our students advance through a gymnastics progression.

The issue of physical readiness, on the other hand, relates to the performer's ability to successfully complete a skill based on components: (1) the performer's

present condition in terms of physical disabilities, muscular strength and endurance, flexibility, postural alignment, and body composition, and (2) the performer's physical status just prior to performance based on a warm-up routine.

Motoric Readiness

1. Stress body awareness activities throughout the gymnastics unit.
2. Check to be sure that the student can perform fundamental movements requisite for gymnastics.
3. Teach the students to use proper landing techniques.
4. Help the performers to be more aware of what they are feeling when they are executing a skill.

Psychological Readiness

1. Never require a student to attempt a skill that he/she is afraid to do. Work with the student to overcome fears, but never force a student to perform by making threats or suggesting that the student is acting foolishly.
2. Do not put extra pressure on a student to perform by making the accomplishment of a particular skill requisite to receiving a passing grade. Find an alternative method for grading a student's performance. Prepare a list of skills that move horizontally as well as vertically and grade the student on the number of skills attempted. For example, list at least ten variations of the forward roll and the same number of variations for each of the other skills which appear at the simpler end of the skill progression. Base your grade not on the number of skills accomplished in the vertical progression but on the number attempted/accomplished overall.
3. Stress self-control. Teach the students to be responsible for their own safety and well-being. Have them learn and practice good safety habits. Teaching the students to be in control will help them reduce their fear and any reckless behavior that may result in injury. For their safety and the safety of those around them, have them learn and practice the safety rules. A written handout, which you review with them at the start of the unit, is probably the best means of conveying this information. If you decide to exercise this option, remember to use language that the student can clearly understand. Figure 1 is a sample of a safety handout which can be given to secondary school students participating in a gymnastics unit.
4. Keep variety in your lessons. If you provide variety and excitement in your lessons your students will be less likely to try to create variety and excitement on their own.

Figure 1. Example of student safety checklist

For Your Safety

Maintaining personal safety in gymnastics is your responsibility. To minimize accidents and protect yourself from injury, conduct your own personal safety check at the beginning of every practice session using the outline given below.

Before Performing: Check Your Appearance

Remove all jewelry, including rings and earrings.

Be sure your hair is worn so that it does not block your vision or the vision of your spotter.

Be sure to wear the appropriate footwear. Heavy sneakers or shoes can be extremely dangerous to you and your spotter.

Never chew gum or have anything in your mouth while you are performing.

Wear clothing that is comfortable, but not baggy. Baggy clothing can impede the ability of the spotter to assist you.

Be sure that your clothing is free of buckles, buttons, rivets, or zippers.

If eyeglasses must be worn, be sure they are secured to your head and have safety lenses.

Before Performing: Check the Area

Be sure the area is sufficiently matted for the skill you are going to perform. As a general rule, the less familiar you are with the skill and/or the more difficult the skill, the more matting you should have.

Check the matting/apparatus to be sure that it is not slippery and that it is free of faults such as rips or gashes.

If using more than one mat, be sure that they are securely fastened together.

Check the landing surface to be sure that it can absorb the weight of the landing or fall and is the appropriate mat for that use.

Be sure mats and apparatus are placed in such a way as to permit ample space for traffic or spotter movement.

Be sure that mats and gymnastics equipment are located a sufficient distance from walls or other apparatus.

Check the area to be sure it is free of small equipment such as balls or ropes that can cause you to trip.

Be sure the pathway you have chosen for your tumbling or vaulting run and your apparatus mounts and dismounts does not interfere with someone else's pathway.

When you are not performing, be sure to yield the right-of-way to those who are.

Continued

Be sure all t-handles, spin locks, safety collars, springs, cables, and floor plates are secure and in proper working condition.

Before Performing: Screen Your Spotters and Yourself

Do not attempt a skill with a student spotter unless your instructor has given you permission to do so.

Be sure to use two spotters at all times unless two spotters will interfere with the free flow of the movement.

Be sure you have a thorough understanding of the skill before you make your first attempt.

Determine whether you are in the proper physical condition to safely execute the skill. Be sure your body is well-conditioned in regard to strength, flexibility, and muscular and cardiovascular endurance.

Do not attempt skills which require a level of fitness beyond your present physical ability.

Be sure you understand the proper progression.

Be sure your spotter knows what skill you would like to try and that he/she knows how to spot it.

Be sure you know the problems you may encounter when attempting this skill.

Be sure your spotters are strong enough to spot a person of your size and ability level.

Be sure you trust your spotters and that your spotters are confident in spotting you.

Attempt new skills at the beginning of the workout session before you become fatigued.

At the Time of Performance: Check Yourself

Be sure to warm up sufficiently so that your muscles and joints are ready for the demands you are about to make on them.

Stop and rest when you or your spotter are tired. Your body cannot perform as well when you are tired and you may cause yourself serious injury.

Follow the progression step by step just as the instructor has outlined.

Only attempt skills in which you have received instruction. Instructions given to another individual do not apply to you.

Perform at your level and not above. Do not try something because of a dare or because someone else says that it is easy. Know your limitations and abide by them.

Always have competent supervision.

Follow a skill through to its completion; never change your mind in the middle of a movement. You can seriously injure yourself or your spotter if you do.

Be sure your spotter knows exactly when you intend to begin. Have a signal that you have arranged between the two of you so that there is no doubt in anyone's mind that you are ready to begin.

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5. Provide a positive working environment for your students. Demonstrate patience and appreciation for their efforts. Don't indirectly push your students to try skills beyond their means because you only give praise to those who are extremely talented or those who attempt the difficult skills. Be positive about everyone's efforts regardless of how small their accomplishments may be.
6. Prepare your students for emergencies. Much of the anxiety and dread we experience during an emergency is due to our feeling of helplessness in the situation. The actions of those around us appear to be chaotic because we do not have a clear understanding of what is to be done. Preparing our students for emergencies in gymnastics will help us to alleviate the sense of helplessness that is pervasive and ensure the proper kind of help from our students when we need it. Discuss with students the possible injuries that can result from an accident in gymnastics, what we can do to avoid them, and what needs to be done when they *do* occur.
7. Generate an attitude of respect and understanding in your gym. Teach your students, through your example, to have respect and understanding for one another. Teach them to step in and assist; help them to be aware of other people and their needs.

Physical Readiness

1. Before the gymnastics unit begins, review the students' medical reports with the school nurse or the athletic trainer. Be familiar with any condition a student may have that could negatively influence his/her performance in gymnastics or that could be aggravated by the activity.
2. Conduct a physical screening program before the gymnastics unit begins. Determine a level of performance that should be met on each test to ensure a proper level of conditioning for each participant. The screening program should include tests that measure strength and muscular endurance of the arms, abdomen, and legs, tests for flexibility of the shoulder girdle, legs, and lower back, a posture screening to determine defects or misalignments that may be aggravated or cause injury, and a test for body composition or a simple weigh-in. Check points should be set for each test that will help the teacher identify students who will be at risk without a special program.
3. Discuss the physical limitations found in the medical record review and the physical screening with the participant and, if necessary, with the parent or guardian. During the meeting discuss the physical limitation and the relationship it has to the success/risk in tumbling.

4. Do not allow a student to resume practice after an injury or serious illness unless you have written permission from a doctor or qualified expert.
5. Prepare an individualized program for anyone you have identified as having special needs. The program should have a fitness component as well as a listing of approved skills which can be ameliorated through conditioning.
6. Keep accurate records of all students' progress. Especially document the progress of those for whom you have prepared special programs.
7. Design a basic warm-up routine which is required at the start of every gymnastics session. Teach the students the warm-up routine you have designed. If you do not intend to perform the routine as a group, post the program on the wall in several areas of the gym and explain the importance of its careful and consistent application.
8. Do not combine the warm-up routine with a training program. Conduct the warm-up routine in the beginning of the workout session and the training program at the end. The warm-up routine should be composed primarily of stretching and flexibility activities. Light jogging and skipping should be used to raise the temperature of the body, not to improve cardiovascular fitness. Work to improve any component of fitness should be left until the end of the session.

Curriculum and Lesson Plan Development

Curriculum

1. The gymnastics unit should be outlined in a curriculum guide that is especially designed for the age and general ability level of the students enrolled in the class.
2. The curriculum objectives should reflect an understanding of gymnastics and the general ability level of the participants.
3. The activities that appear in the unit should be directly related to the achievement of the objectives.
4. The activities should be screened to ascertain whether:
   - they constitute the most appropriate means of achieving the objective
   - they are appropriate for the intended age group
   - the teaching staff is capable of delivering the activity
   - there is a record of injury connected with the delivery of this activity
   - they are recommended by experts in the field
   - they fit appropriately in the skill progression

5. The activities should be organized in a proper progression. The progression should:
   - move vertically as well as horizontally, that is, the skill should be presented with many variations so that the performer does not feel pushed to move on in the vertical progression until he or she has sufficiently mastered the skill. Skills can be varied by changing the starting position, changing the finish/landing, putting the skill in a sequence, or changing the position of the arms or legs during movement.
   - contain many lead-up activities for each skill. The lead-up activities should familiarize the performer with the basic components of the skill before they ever attempt the full movement
   - contain body awareness activities
   - contain spatial awareness activities
   - include combinations of skills which can be performed safely by those who have mastered the requisite movements
6. The gymnastics unit should contain sound justification for its inclusion in the overall curriculum.
7. The gymnastics curriculum should contain a series of units that demonstrates expected skill development from grade to grade.
8. The curriculum should outline the appropriate teaching techniques.
9. You should not deviate from the curriculum guide. If you decide to do so, however, you should state this in your lesson plan citing the educational principles you used to reach your decision.

Lesson Plans

1. Specific lesson plans should be prepared for every lesson you teach.
2. Your lesson plan should include:
   - the objectives for the lesson
   - the activities that are used to achieve the objectives
   - a detailed description of the teaching methods that are used to deliver the activity
3. Taken collectively, your lesson plans should demonstrate the progress of your class in the unit.
4. Lesson plans should be kept on file in an accessible location such as a central office.

Student Spotter

1. Train student spotters in the recommended techniques.

2. Give them ample practice with people who can perform the skill before you ask them to spot someone who is just learning.
3. Evaluate them periodically to ascertain their effectiveness.
4. Only ask them to work with someone they can handle. Never ask them to assist someone who outweighs them or is too tall for them to spot safely.
5. Screen the performer they are about to spot to be sure the performer is ready to attempt the skill and that he or she demonstrates reasonable potential for success.
6. Never ask them to spot a performer who is attempting a moderately difficult skill unless you have worked with the performer and you are sure he or she only needs slight assistance.
7. Never ask them to spot a performer who is attempting a difficult skill no matter how talented the performer is.
8. Give them frequent breaks to reduce their level of fatigue.
9. Give them every available advantage in terms of matting. Never ask the spotter to assist unless there is ample matting.
10. Only ask them to spot performers who are executing skills from a stationary position. Never ask them to spot someone who is on the run or moving rapidly from one skill to another on the apparatus.

Teacher as Spotter

1. Do not substitute spotting for good fundamentals. Do not put students through a skill unless they are physically, motorically, and emotionally ready.
2. Thoroughly understand the mechanics of the skill before you attempt to spot it.
3. Become familiar with all the things that can go wrong during the execution of a skill so that you are prepared for any emergency.
4. Review the components of the skill with the performers before they begin any attempt. This will allow you to give feedback as well as to reinforce the important aspects of the skill.
5. Explain the mechanics of your spotting technique to the performer so that he or she knows what you are going to do.
6. Try a new spot (one you are just learning) on a performer who has mastered the skill. This should preferably be done in the presence of a qualified instructor who can assist you if necessary.
7. Spot only those students you can easily assist. Never spot someone who is too heavy or too large for your physical capability.
8. Stay close to the performer and provide continuous assistance throughout the execution of the skill. As the performer becomes more accom-

plished avoid excessive spotting which may impede the motoric rhythm of the movement.

9. Become aware of each performer's idiosyncratic behavior. Prepare for the worst thing they may do.
10. Do not give in to a performer who wishes to try a skill, but who is not ready for the challenge.
11. Use spotting techniques employing biomechanical principles that assist you in the lift and protect the performer's vital areas (spine and neck).
12. Establish a signal between the performer and you which eliminates any surprise as to the exact time an attempt will take place.
13. Never leave a performer posed to execute a skill and turn to talk to someone else.
14. Never lose contact with the rest of the group while you are spotting a specific person. Between attempts, take time to supervise the area.
15. Never lose your concentration. Complete the entire spot before moving on to correct a situation in another part of the gym.

Safety Equipment

1. Use safety equipment (safety belt, overhead belt, and traveling overhead belt) that best suits the circumstances. The decision should be based on:
   - the ability of the gymnast
   - the ability of the spotter
   - the difficulty of the skill being learned
2. If safety equipment is to be used, you should practice with it on a regular basis so that you can work the equipment efficiently and do not present a hazard to the performer.
3. Safety equipment should not be used unless it is inspected for safety just before use.
4. Only qualified instructors should use overhead safety equipment.
5. You should be familiar with the potential problems associated with using an overhead safety belt so that you are prepared for any emergency.

Environmental Conditions

In addition to providing effective supervision, appropriate activities, and proper teaching techniques, you have a responsibility to provide a safe environment and well-maintained and up-to-date equipment. Following are guidelines you should use to ensure a safe environment for your students.

General Considerations

1. The gymnastics area must never be left open or unsupervised.
2. Gymnastics equipment should never be left out in a multipurpose area. The equipment should be secured in an equipment closet. If an equipment room is not available, the mats and apparatus should be secured in some manner so that they cannot be used by unsupervised students.
3. Warning signs should be posted throughout the area reminding the students of the safety rules, especially those which forbid any type of activity without the assistance of a qualified instructor.
4. Students should not be allowed to move equipment unless they (1) have been taught how to do it properly and (2) have been given permission to do so. This will protect the students against injury and the equipment from damage through mishandling.
5. Spectators, including students with medical excuses, should not be allowed in the gymnastics area. A place should be set aside for nonparticipants that keeps them out of the path of the performers.
6. Where safety specifications have been established by a national association or a manufacturer, be sure your facility and equipment meet or exceed the minimum standards.
7. Develop an inspection policy which stipulates:
   - the regularity (yearly, monthly, weekly, or daily) with which each piece of equipment and aspect of the facility should be inspected
   - the specific personnel or outside organization that is responsible for the inspection
   - the items to be inspected and the conditions that are considered acceptable
   - the records to be kept and the place of filing
   - the procedures used to determine whether an item is to be replaced or repaired
8. Be sure the floors are cleaned daily and, if need be, between classes, to be sure that chalk, dust, and other slippery material have been removed.

Gymnastics Area

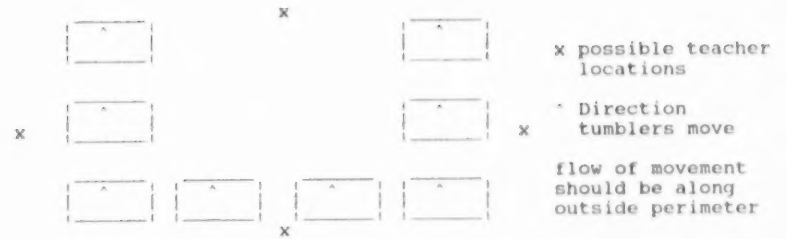
1. The gymnastics area should be large enough to accommodate the number of students who will be participating.
2. The area should be free of any pillars or posts.
3. The walls should be free of any protruding parts.
4. The area should be physically separated from all other activities, especially those that require the use of balls. A partition of some sort should be used (e.g.,ceiling to floor netting, ceiling to floor moving door). Cones

and other such markings are not acceptable unless the opposing activity is compatible (dance is an example of a compatible activity).

5. The area should be easily accessible to emergency first aid personnel.
6. A phone or some other means of communication with emergency personnel should be available on site. If direct communication is not available, a plan which is known to all instructors should be devised which will ensure the fastest method of obtaining help.
7. The area should not contain windows that are at eye level. Windows, if any, should be located high in the room.
8. Any windows in the area should be masked in some way so that the light that enters is muted. Bright light may interrupt the vision of the performers or spotters and cause them to break their concentration or lose their line of sight.

Physical Layout

1. Place mats/apparatus in a pattern so that you can maintain a clear line of sight with every group.
2. Be sure that ample space (6-10 feet) is left between each mat/apparatus to accommodate the traffic flow.
3. Place mats in such a way that you can specify the exact direction in which everyone should tumble.
4. Keep mats/apparatus the recommended distance from walls or obstacles.
5. Keep mats/apparatus away from doors including equipment room doors even if the room is not normally used during the class period.
6. Many safe organizational patterns are possible. Figure 2 illustrates two possible configurations for tumbling mats.
7. Be sure ample space is available for safe dismounting from apparatus. Set up equipment so that invisible runways such as those for the horse are not in the middle of the gym where performers are likely to cut across them as they move from area to area.
8. Never overlap mats so that they create uneven surfaces on which the performer can trip or twist a body part.
9. Place mats so that open folds and handles face the floor. Open folds that face upward are an extreme hazard.
10. Be sure landing areas are not placed where there is a heavy traffic flow. Isolate landing areas as much as possible.



Teacher assists from outside the horseshoe x's indicate several alternative locations where a teacher can stand.

Never use more than two rows of mats or you will loose the ability to view the whole class when trying to assist someone in the middle rows.

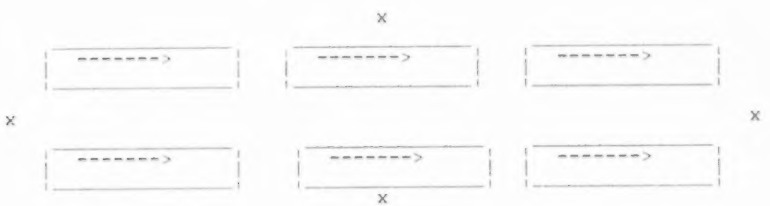


Figure 2. Two examples of tumbling area configurations

Matting and Apparatus

1. Use matting and apparatus only for the purposes for which they were intended. Information on recommended use can be obtained from the manufacturer and the national bodies governing the sport of gymnastics.
2. Remember that mats are not a substitute for good progressions, good landings, and competent spotting.
3. The amount and kind of matting required will depend on:
   - the skill being performed — the more difficult the skill, the more matting required
   - the ability level of the performer — the lower the ability, or the less experienced the performer, the more matting required
   - the landing required by the performer and the stability under foot required by the spotter
   - the age of the performer
   - the resiliency of the mat due to age and use
4. Check mats/apparatus daily for: rips and gashes; worn surfaces, cracks, cleanliness, deterioration of cushioning material; resiliency and absorption; and quality of connecting surfaces (e.g., Velcro fasteners). Remove mats/apparatus that require even minimal repair.
5. Be sure all mats/apparatus have a warning label attached. Extra warning labels can be obtained from the manufacturer to replace worn or lost notices.
6. Be sure you use the correct matting. There are three different types of mats: base mats, landing mats, and safety mats:
   - base mats are 1–2 inches and are used for tumbling and as the first layer of matter under apparatus
   - landing mats are 4–8 inches and are used whenever performers will be executing stable two-footed landings
   - safety mat are 8–36 inches and are used for learning new skills
7. Be sure all t-handles, spin locks, safety collars, springs, cables, and floor plates are secure and in proper working condition.

Participant Warning

It is the instructor's duty to notify the participants, and if necessary the participants' families, of the possible risks in gymnastics. A warning in the form of signs that illustrate what can happen to the participant if safety rules are ignored, a personal letter which explains the hazards that are involved with the sport, or a written test which evaluates the student's knowledge of the safety rules and the possible consequences of unsafe practices all provide notice to

the participant of the possible hazards in the activity. The decision to use one or all of them will depend on the age and experience of the performers.

Safety—An Ongoing Process

Gymnastics can be a safe and exhilarating experience for students if the teacher takes control of the activity and makes it such. Implementing the recommendations made in this chapter will be a positive first step in minimizing the risks associated with the activity. Once the standards are met, however, one should not become complacent. Risk management requires constant vigilance and persistence if we are to constantly ensure the safety of our students.

17

Orienteering

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The instructor of a student orienteering program may face some anxiety when the students are out on the course and the instructor is left alone. It doesn't take long to begin worrying about what is really happening to the students out there. Is everything all right? Are the students making the correct decisions? Why aren't the students returning yet? At this point, there are three courses of action: (1) sit and worry; (2) run out and spot check the course; or (3) plan for the next orienteering class, which will stress safety and "lost proofing" the students. How much better it would have been to have included safety planning and instruction in the program at the outset!

Equipment

Begin the safety planning process by checking all equipment. Any compass can be used for orienteering but, regardless of the type that is used, it must be in working order. The easiest way to check a compass is to ask the students to point in the direction that the north seeking arrow is pointing, then turn 180 and do the same thing again. The most common problem with a new compass is reversed polarity, that is, the north arrow points south. When this is found to be the case, either return the compass to the vendor or dispose of it. One compass with reversed polarity may be kept for use when demonstrating compass handling. A reversed polarity compass can be used while facing the students, thus allowing the instructor to easily maintain visual contact

with them. Keep a special lanyard on this compass for easy identification and to prevent confusion with the properly oriented compasses.

With older compasses, there is often a loss of dampening fluid. If it is a relatively small loss the compass will probably still be usable. Too large a bubble can, however, obstruct the free movement of the needle. If this is the case, the compass could not be used. One school system lost many compasses until orienteering maps were sandwiched between sheets of 1/8" plexiglass, glued and riveted, with a compass attached to the finished product.

A whistle on a lanyard that can be worn on the neck or wrist is a plus. Students should be instructed that the whistle is to be used only in an emergency. Three repeated short blasts are a summons for help while a single short blast identifies the searcher who has heard the three short blasts and wants them repeated.

A small brightly colored day pack or fanny pack equipped with some emergency supplies should be carried at all times except in competition. There are good first aid kits on the market. One of these should be chosen and supplemented from the following list, depending on the area and time of year.

butterfly closures for large cuts (practice using)
safety pins
matches, waterproof, in waterproof container or magnesium fire starter
water in canteen and/or clear plastic with push-pull cap
magnifying glass
large bandanna
signal mirrors, available from marine and surplus stores (practice using them)
emergency "space" blanket
candle
nylon wind and/or rain pants
needle and nylon thread
extra map of area
whistle that is loud but does not require much wind
small flashlight with alkaline batteries
knife

The list could go on, depending on how much the participants are willing to carry. Or, it may be best to consult the "X essentials" listed by various outings clubs and national organizations.

Although it is possible to purchase maps with declination lines already in place, it will often be necessary to draw them yourself. Take the following precautions. When drawing magnetic north/south lines on a map, use a protractor or Silva type compass to lay out the number of degrees of declination. The U.S. Geological Survey warns that the diagram pictured on the lower left

margin of their maps is only an approximation of the actual number, which is printed next to the magnetic north arrow. This number is accurate for the year printed just below the diagram. Deviation may change very little or as much as one degree in five years. The current deviation for an area can be obtained by calling the National Cartographic Information Center, Reston, Virginia. The toll free number is 1-800-USA-MAPS. The magnetic north/south lines are placed at a convenient and uniform distance apart (500 feet to 1,000 feet, or ½ mile) and they can aid the orienteer in judging distance. Any time when drawing lines or making marks on a map, be careful not to cover or obscure any important symbols. A piece of clear plastic can be used as a straight edge which makes it possible to see whatever symbols are along the line. Leave a break in the line where symbols occur. If a 6mm hole is drilled in the plastic straight edge, it can be used to make the circles that mark the control points on the map. When making circles, skip a space if any symbols would be obscured. Do not put a dot in the center of the circle. Make sure the ink in the writing implement is not water soluble.

It is important to draw parallel magnetic north lines (arrows) on the map you reproduce because if you do not, it is likely that students will draw magnetic north/south lines using the diagram or, worse yet, confuse magnetic north and true south.

Supervision

Because of the nature of orienteering, it is impossible to maintain visual contact with all students at all times. After the initial learning experiences, during which the students can and should be grouped in an open area and constantly observed, the students will, of necessity, be released onto orienteering courses of gradually increasing size and difficulty. Once this phase of the activity has begun, it is no longer possible to maintain visual contact with the entire class. It is important, under these circumstances, that an area be set aside where the students can always find help if it is needed or desired. The base area should be relatively central in location and easily found. Placement near some prominent and recognizable features such as power lines, or atop an easily distinguished hill, would assist the students in quickly locating assistance if needed.

Conduct of the Activity

Since the students will be on their own for a significant portion of the orienteering unit, proper preliminary instruction and safety training is essen-

tial. Orienteering skills should be learned and practiced under supervision to guarantee full knowledge of and compliance with safe practices and procedures. Course and safety rules should be understood and followed by all. Rules should be printed either on the back of each map board or on a separate sheet included with it.

In addition to orienteering skills, students should be provided with an understanding of basic survival techniques. This will increase their confidence in the field and provide an added margin of safety in the unlikely event that someone is lost for more than a matter of minutes or hours. An introductory survival course should include instruction in how to:

- use the equipment and supplies in the emergency kit
- help searchers find the lost student
- treat an injury or sudden illness
- build a shelter
- conserve energy and temperature
- signal for help
- forage for food
- be safe in a storm
- remain calm and wait for help

It is generally best to send students onto the orienteering course in groups of three. If teams of three are used and one person is injured, another can stay with him/her while a third goes for help. While larger groups provide the same advantage, they tend to become unwieldy and result in lowered involvement for individual students.

If the instructor does not know the students and would like to send them out in teams of two or three with at least one capable student in each team, use the beginner Compass Game available from Orienteering Services, USA, P.O. Box 1604, Binghamton, NY 13902. This game may be played in any open area approximately 100 x 100 feet. To play, the participant must be able to find directions with a compass. No pacing of distances is necessary. There are 90 courses, using eight labeled markers placed at exact spots in a large circle. While playing the game, all players are contained in the circle. This game makes it easy to identify the students with the most and least aptitude. As the students complete the game, they must report to the instructor to find out if the courses they've charted are correct. If they are, put their names at the top of a roster and ask them to help students who do not have everything right. The list formed this way will rank the students from most to least proficient. When it is time to make up the teams, they can be made up of one person from the top, middle, and bottom of the list. Another option is to send the first-time orienteers on an open mini-course that will take only a few minutes and allow them to demonstrate their ability to manipulate a map and compass.

In deciding how difficult or easy to make the orienteering course, the instructor must take into consideration the age, experience, and skill of the participants as well as weather conditions and time of the day and year. If you run a course in the morning and the afternoon, it would be best for the more experienced group to run a more challenging course in the morning and the less experienced group to tackle an easier course in the afternoon, especially in the winter when the days are shorter. Courses laid out for beginning orienteers should have all stations accessible from trails.

Even if there is an alarm that can be sounded in the event of a problem, everyone won't hear it. It is important to establish an understanding ahead of time concerning cancellation of the event due to storms, falling trees, or other emergency. Trees may fall at any time. When the ground is soft after a soaking rain, trees may fall even without wind. Anyone who sees or hears two or more trees fall of natural causes in a short period of time should take a direct route to the nearest road or clear area and report this information to the person in charge. Make sure orienteers understand what to do in a severe thunderstorm, particularly with frequent lightning.

Even if students understand all the fundamentals of orienteering, they should be "lost proofed," or taught to orient themselves to the larger geographic area before they go out. This can be accomplished by using a large wall map that covers a greater area than the orienteering map.

Prominent mountains with specific shapes can serve as gross reference points. Identify any off limits or dangerous areas and the farthest limits students should go. There might be a long straight road one side, a river on another, and a power line on the third. Anyone who goes far enough in a straight line will end up at one of these features serving as a perimeter and reference point for those who get that far. If operating in an area where such features as the above are not to be found, advise students to trust their compass. It will get them very close to where they want to be or back to where they started.

In the event that participants lose their compass or feel hopelessly lost, they should be instructed to hike down hill until they find a trail or stream. Water will eventually lead to some sign of civilization. Instruct them on how to ask for help and point out that the phone number where the instructor can be reached is on the map. (Be sure always to include a phone number on the map.)

If students are only going to be out for a short time, they should take a bearing on the sun and notice the direction their shadows cast. It is a good idea to point out the approximate direction the sun will be in two hours and its course across the sky. Even after sunset the western part of the sky will be lighter for hours unless there is a bright moon or the reflected lights of a city.

If some students do not return at the expected time, they may be lost, in need of emergency care, or if they are unreliable, may have abandoned the

course and wandered off to their own interests. Schools often run one orienteering course in the morning and another in the afternoon. If someone is late returning in the morning, the instructor may have the leisure to wait a while. If someone is late in returning in the afternoon, especially in the winter when it gets dark earlier, time is more critical. An unaccounted-for person can create an urgent situation that requires response in the form of search procedures. A delay of two hours instead of one means that the search area will, of necessity, be four times larger. Figure 1 illustrates the effect of time on a search area.

In the search situation, do not delay. Decide who is going to be in charge (stays in central area and maintains communications), then fill out a missing person questionnaire (see sample, Figure 2).

Send out a few people who can patrol the perimeter of the search area. These searchers should travel in the fastest way possible—car, boat, all-terrain bicycle, or on foot.

Try to attract the lost person by ringing bells, blowing vehicle or air horns, or using whistles. This "attention getting" should be done from an open area so that sound will travel better. Searchers should be careful not to make any

Figure 1. An hour's delay means a search area will be four times larger

Name		Age	Sex	Race	Ht	Wt
Build	Hair	Length		Other		
Shirt		Sweater Jacket				
Pants		Shoes				
Hat	Gloves			Glasses		
Raingear	Other					
General Condition						
Medical Problems						
Psychological Problems						
Handicaps	Medication					
Smoke Drink	Drugs					
Outdoors Interest						
Outgoing Quiet	Hitchhike?		Ever Run Away?			
Depression?	Give Up Keep Going					
Stop Keep Moving	Other					
Last seen Time	Place					
By Whom	Direction					
Reason for Leaving						
Destination	Pickup?					
Unusual Behavior						
Pack	Tent		Sleeping Bag			
Food	Drink		Map Compass			
Matches	Flashlight	Firearm		Camera		
Other						
Outdoor Skills						
Familiar with area?						
Ever out overnight?	Ever Lost Before?					
Trails/Crosscountry						
Talk to Strangers?	Accept Rides?		If Lost			
Specific Fears Interests						
Other						
Tendency to Hide?						
Old Haunts, Special Places						
Other						
Anything Else?						

Figure 2. Missing person questionnaire

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sounds that could be mistaken for a series of three that would be the call for help from the lost orienteer. It is important to frequently pause to listen for a call from the lost student.

If there is a narrow off-road area through which a disoriented person might wander and thus enlarge the search area, this area should be heavily patrolled. It is important to confine the search area to as small a plot as possible. In off-road areas it is more important to look for signs or clues of the missing person. If the searchers are looking only for the person they could very easily miss the traces or other evidence that could concentrate the area of search and ensure a quicker discovery.

If there is a high point from which much of the search area can be surveyed, assign at least two people to this point so that they can take turns scanning the area. Binoculars should only be used to identify something already spotted.

In the rare case where someone is not found after a reasonable time, check his or her home, friends' houses, hospitals, and favorite hangout. If this is unsuccessful, the sheriff or police should be called. Once this decision has been made, resist the temptation to go into the general area where the lost person is suspected of being. Since tracking dogs may be used, do not allow anyone to touch any articles of found clothing. Pick up articles with a stick and put in a clean plastic bag and store in a cool place. If more than one person is lost, store items in separate bags and label them.

The police or sheriff will interview the instructor, scan the area, and call a rescue team. They will probably have tracking dogs that will search for a particular scent left on the ground by the lost individual. They may have air scent dogs that can quickly smell the air for any human scent, not just the lost persons. A trained handler and dog can be as effective as 20 or 30 human searchers. It is important to keep well-meaning but inexperienced individuals out of the area; trained search and rescue personnel and their dogs will have a much better chance of finding the missing person.

The instructor and the orienteers constitute the largest group with the most immediate knowledge of the area. Should this group be used to try to find the subject or use them to confine the search area? This will always be the dilemma faced by the person in charge. The National Association for Search and Rescue offers training, data collection, educational programs, and conferences that provide the skills necessary to manage a complete search and rescue operation. Instructors who are conducting orienteering meets in areas where participants could be lost for long periods of time should avail themselves of these services. For information, write to NASAR, P.O. Box 50178, Washington, DC 20004.

The United States Orienteering Federation, P.O. Box 1444, Forest Park, GA 30051, was established in 1971 to promote orienteering in the United

States. It can put any interested person in touch with a local club in your area or help you start a group if none is close by. Their magazine, *Orienteering U.S.A.*, is published nine times a year and contains information on improving orienteering skills, map making, rules for competition, safety, and orienteering for ages and skills. Belonging to USOF includes automatic membership in the International Orienteering Federation.

At a recent convention workshop the USOF produced the following document outlining search and rescue techniques, emphasizing preplanning.

Search and Rescue

To avoid unnecessary searches the organizing personnel should:

1. Make sure the meet area has clear boundaries such as roads or rivers.
2. Make certain that a person not only has registered but has started the course.
3. Know how many participants there are and have a brief individual description, e.g., age, sex.
4. Make certain to impress upon all meet participants the necessity to check in even if the course is not finished.

Following are recommendations for preliminary meet preparations to ensure a successful search and rescue:

1. Know your victim! A novice orienteer is likely lost and may have wandered far from the chosen course. An experienced orienteer is likely injured and near the route.
2. Require all orienteers to carry a whistle. A different code for victim and searchers must be decided on beforehand.
3. Have some emergency instructions for the orienteer incorporating common wisdom of steps to take when lost.
4. Have a club first aid kit with a list of emergency numbers for the nearest professional medical assistance, ambulance, sheriff's department, club members with CPR and first-aid training, etc.
5. Have a prepared list of personnel able and willing to be part of an emergency team.
6. Organize a group CPR and first-aid course for club members.
7. Carry equipment helpful in searching. Items to include would be a whistle, a headlamp, or powerful flashlight.
8. Have the meet director know location of nearest telephone.
9. Decide on the particular type of communication control equipment to be used in the meet area.

(United States Orienteering Federation Workshop, 1986. Reprinted with permission.)

In the event of an actual search, it is absolutely essential that a search coordinator and a control center be set up. The duties of the coordinator include coordination of efforts with other groups (e.g., forest rangers), exact knowledge of the search parties' locations, and recall of the searchers. Knowledge of the terrain will modify conditions and alter plans.

As knowledge accumulates in search techniques, it should be shared with other clubs and USOF. Orienteers at all levels feel more secure knowing that their club can demonstrate expertise in searching.

Most outdoor emergencies can be dealt with satisfactorily given the proper training. The fact that students are in the field navigating with map and compass means that they have a valuable survival skill. They are also more likely to go out on their own and venture farther afield. The teacher who has given students the confidence to navigate through the wilderness should also be sure they know the importance of informing someone of their whereabouts and carrying certain emergency supplies. Whether someone goes out alone or with a partner, a responsible person should always be informed of where they are going, what they are doing, and when they expect to be back.

Because the emphasis has been on safety throughout this chapter, one might get the impression that orienteering is dangerous or risky, but this need not be the case. In over 15 years of conducting orienteering activities involving thousands of students, the author has had no one seriously injured or even lost for a long period of time. However, knowing what to do should such emergencies arise can give the teacher confidence to offer activities such as orienteering that otherwise might be avoided. From an instructional point of view, orienteering is an ideal activity because it is enjoyable as well as educational and students find it both challenging and satisfying.

18

Playground Activities

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The U.S. Consumer Products Safety Commission (USCPSC) estimates that 170,200 public playground equipment related injuries were treated in hospital emergency rooms in 1988 (Tinsworth & Kramer, 1990). However, only 1% were admitted to the hospital for additional care. Three-fourths of the injuries were to children under the age of nine. Both boys and girls were equally represented in the injury statistics. Three-fourths of the injuries were caused by falls with 58% being falls from the equipment to the surface below. For children under the age of six, slides accounted for about 43% of their injuries. Children over the age of six were most often injured on the climbing equipment. Of the injuries to school age children, 40% were to the head and face and 42% to the arm and hand.

A safe playground requires the total involvement of school system personnel. The system must have a safety policy in effect, clearly stating school administrator, teacher, and playground aide responsibilities, safety committee duties, maintenance procedures, and accident reporting procedures. The local school staff in conjunction with the safety committee should develop a risk management program with a strong emphasis on supervision and education.

Supervision

The following guidelines are based on information from Montgomery County (MD) Public Schools, as set forth in its *Playground Safety Handbook*.

The school administrator should:

1. Establish a school safety committee comprised of but not limited to an administrator, classroom teacher, patrol sponsor, building service manager, school nurse, physical education teacher, and a student. If a person is hired to supervise the playground, then he/she should be part of the committee.
2. Develop guidelines for safe and acceptable playground activities and use of the play equipment
3. Provide training for the staff supervising children on the playground
4. Identify children with specific health problems that are pertinent to playground situations (e.g., asthma, bee sting allergies)
5. Include in the school discipline policy consequences for inappropriate playground behavior
6. Assign an appropriate number of adults to supervise the play area
7. Designate a staff member to inspect the playground equipment on a regularly scheduled basis and to follow up on repair/maintenance work
8. Require a daily check of the school grounds by appropriate staff for broken glass, harmful debris, trash, etc.

The physical education teacher should:

1. Be a member of the safety committee
2. Check the playground equipment on a routine basis
3. Assist in establishing a set of playground rules
4. Teach safety procedures and playground rules to students
5. Teach appropriate use of the playground equipment
7. Suggest and/or provide equipment and supplies (balls, jump ropes) for students to use on the playground
8. Collect and disseminate information from professional publications related to playground safety

The noontime aide/adult supervising the playground should:

1. Be a member of the safety committee
2. Know the playground rules and consistently and fairly enforce those rules
3. Know what games and activities can be played in an area and know the basic rules of those games
4. Know and follow the school accident reporting procedures
5. Have basic first aid training
6. Check the playground for unsafe situations (broken equipment, debris, insufficient surfacing under equipment, etc.)
7. Provide in writing to the school administration notice of unsafe conditions or activities

8. Move around the playing area without being involved in games or long conversations with students or other adults
9. Never leave the area unsupervised except in cases of extreme emergencies
10. Know by sight those students with specific health problems who may need assistance

The safety committee should:

1. Meet to review the guidelines and rules for the playground, revising when necessary
2. Review all accident reports, responding appropriately to trends in the data
3. Conduct training seminars for staff on safety issues including supervision, equipment inspection, and appropriate playground activities
4. Distribute to all staff members any guidelines from the equipment manufacturer relating to the use or maintenance of the equipment

Safety Awareness and Appropriate Activities

The following guidelines should assist local jurisdictions in establishing standards for supervision of students using the playground. Schools may need to develop additional standards or refine the following to suit local needs. Students should be involved in making and revising playground rules.

Playground Areas

Where possible, the playground should be divided into areas for traditional field games (e.g., soccer, kickball), macadam activities (e.g., four square, hopscotch, basketball), and playground equipment (e.g., climbers, swings). Students should be aware of these divisions and made to play accordingly. For example, children should not play tag in and around the playground equipment.

Appropriate Activities

Space permitting, jump rope, basketball, volleyball and other net games, and activities taught by the physical education teacher are acceptable on the macadam area. If tagging games are permitted, they should be restricted to grassy areas.

Soccer, field games, kickball using softball rules, ball-type games, or games taught by the physical educator should be played in the field areas. If the school district allows baseball or football to be played by elementary aged

students, the sports should not be played at noontime unless students can be directly supervised by trained personnel. Softball, with appropriate safety equipment, likewise should be restricted to the direct supervision of a knowledgeable staff member.

Children should be instructed not to play with neighborhood pets, throw or kick stones, sticks, or other objects, bounce objects such as glass, wrestle, fight, or tease other students. Students should never leave the school property. If balls or other play items inadvertently leave the area, an adult should be summoned. Create a buffer zone near the building so students do not disturb children in their classrooms.

Rules for Playground Equipment

1. Children should not play tag in and around the playground equipment.
2. Wet equipment or decks covered with frost, snow, or ice should not be used.
3. Children's feet should remain below their hands unless the play piece was designed for turning or inversion stunts.
4. Children should use equipment in accordance with safety instructions presented by the school staff.
5. Children should not overload a single piece of equipment.

Discipline

When an infraction occurs, the supervisor should speak to the student in a positive manner and tone. State the problem, what could happen if rules are broken, and what the student should do. Do not belittle or ignore student complaints. If a child consistently creates problems, then the classroom teacher should be consulted, or in serious offenses, the school administrator. Oftentimes requesting that the student play in another game and/or area, or even a brief "time out," will solve the problem. Many students prefer a quiet noontime instead of active games. Set aside a space with picnic tables or benches for reading, games, or drawing.

Injuries, Illness, and First Aid

The playground supervisor should be sympathetic to all injuries, even minor or perceived injuries. In case of a minor injury that requires treatment, the student may be taken to the office by two other responsible students. A person trained in first aid and CPR should be available in the school to handle emergencies. Ideally, all supervisors of the playground would have some basic first aid training, but it isn't always possible to train every staff member. The play-

ground should never be left unsupervised except in extreme emergencies. Most playgrounds are located near the school so that other adults can be quickly called on to assist the playground supervisor in case of an emergency.

The student accident report form should be completed as soon as possible while facts and conditions are apparent. See Chapter 3 in this text for an example of this form.

Surfacing

All playground equipment should be installed over a surface that meets the U.S. Consumer Products Safety Commission's guidelines for surfacing (Ramsey, 1990). Suggested surfaces include sand, shredded hardwood bark, wood chips, pea gravel, or synthetic materials. Once the surface is installed it is crucial that the area be checked on a routine basis by the principal designee to ascertain the integrity of the surface.

Natural surfaces require more maintenance as they decompose, wash away, or are kicked out of the area. This erosion will occur more quickly in areas of access and egress.

Risk Management

It is highly recommended that schools establish a risk management process. Such a program includes: (1) design and layout, (2) purchasing, (3) installation, (4) maintenance, (5) repair, and (6) safety education.

A file containing the basic documentation listed below should be kept in the school office. A more comprehensive documentation checklist can be found in Chapter 9 of *Play For All Guidelines* (Moore et al., 1987).

1. Name and address of equipment manufacturer
2. Date of purchase
3. Warranty information
5. Equipment and component specifications to be used when repairing or replacing parts
6. Maintenance checklists and repair dates
7. Accident reports including steps taken to rectify the situation
8. Safety committee minutes and reports
9. Safety education program agendas and attendees

Design and Layout

Playground designers should consider many factors when planning play spaces for children. Among them are:

1. Ages of potential users
2. Supervision of users including visibility
3. Opportunities for a variety of activities
4. User traffic patterns throughout the area
5. Use zones for the play equipment
6. Accessibility of play area and equipment to the disabled
7. Cost of equipment, installation, and preventative maintenance programs
8. Vehicular and pedestrian access to the area
9. Landscaping

Purchasing

The USCPSC has published two documents that provide guidelines for playground equipment (USCPSC 1981a, 1981b). In addition, the American Society for Testing and Materials (ASTM) has a task group comprised of consumers and manufacturers developing standards for public use playgrounds. Once this task group has a standard, local school districts should buy equipment that meets both USCPSC guidelines and ASTM standards.

Local jurisdictions should develop guidelines and purchasing procedures to assist schools and PTAs. These guidelines would include approval and inspection procedures, recommended equipment suppliers and installers, site qualifications, and approved/disapproved equipment.

Installation

The school district should carefully consider insurance regulations and legal issues prior to installing play equipment. Equipment installed by a contractor who is licensed and insured to install play equipment is preferable. Generally, installation costs run 30–40% of the equipment cost. In order to defray expenses, many local districts use volunteers to install equipment with the manufacturer providing guidance and supervision. The issues of liability need to be addressed before construction commences.

Modifying or not following the manufacturer's recommendation may negate warranties or affect legal positions. The equipment supplier should be consulted before making any structural changes during the lifetime of the product.

Maintenance

Play equipment that is properly maintained helps to ensure a safe environment for students. Every school should have a regular schedule for inspections. A written report of these inspections should be maintained in the school files. Checklists for daily, monthly, and yearly reports are found in several references (e.g., Thompson, 1990).

Repair

Even the best equipment will need some repair work during its lifetime. The manufacturer should provide a list of parts with the initial purchase. The repair should be made within a reasonable length of time. If the repair will take some time or the situation is hazardous, the equipment should be placed "off limits." If the equipment is to be placed "off limits," signs, plastic tape, or fencing should mark off the area. An announcement should be made to all students, and in some cases, a notice should be sent home to parents. Figure 1 is an example of an effective form for recording needed repairs.

Safety Education

Every school year, preferably at the beginning, teachers and staff members should meet to review playground procedures. In turn, the teachers discuss with students safe playground behavior. Whenever new equipment is added to the area, staff and students must be given an explanation for its use and appropriate activities discussed. If a long period of time has elapsed since the use of the equipment, students should be reminded of procedures before going outside again. Some school systems have instituted a playground safety curriculum for elementary school students (Daugs & Fukui, 1988).

A letter sent to parents alerting them to the potential for injury on the playground may help to educate the public on the safe use of playgrounds ((Bruya, 1988). See Figure 2 for an example. Additionally, signs can be posted around the area, particularly at entrances, to alert users to possible dangers.

A safe playground is an enjoyable one for students and adults alike. With a proper surface under the equipment, proper design, and most importantly, supervision and education, a school district can provide students with a rich environment in which to play.

Department of Health and Physical Education
MONTGOMERY COUNTY PUBLIC SCHOOLS
Rockville, Maryland

ELEMENTARY PHYSICAL EDUCATION
OUTDOOR EQUIPMENT STATUS REPORT

INSTRUCTIONS: This form is to be completed by the elementary physical education teacher. Place an (X) in the space to indicate what repair item(s) are needed. If there are additional items not contained on this form, place under the columns for OTHER (LIST) and identify the equipment and type of repair which is necessary. Prepare a work order for items needing repair and forward to area maintenance supervisor.

REPAIR ITEM	JUNGLE GYMS	SWEDISH GYM EXERCISER	SWEDISH OBSTACLE COURSE	MUSCLE MAN	RAINBOW/BUNKER HILL CLIMBER	MONKEY RINGS	HORIZONTAL BARS	HORIZONTAL LADDER	PARALLEL BARS	CLIMBING POLE/TREE CLIMBERS	SEESAW/CRANE	TURNING BARS	SMALL METAL SYSTEM	LARGE METAL SYSTEM	SMALL WOOD SYSTEM	LARGE WOOD SYSTEM	BASKETBALL POLES GOAL/BOARD	VOLLEYBALL POSTS	TETHER BALL POSTS	KINDERGARTEN AREA	BLACKTOP	PRIMARY AREA	BLACKTOP	UPPER LEVEL BLACKTOP	PLAY FIELD	MULCH/TIMBER	FENCES	SOFTBALL BACKSTOPS	SOCCER GOALS	BENCHES	FITNESS OBSTACLE COURSE	BALANCE BEAMS	HOME/PITCHERS PLATE	OTHER (LIST)			
UNREPAIRABLE																																					
ROUGH BROKEN SUNKEN AREAS																																					
EROSION APPARATUS LANDING AREAS																																					
LOOSE EXPOSED CONCRETE FOOTERS																																					
LOOSE ANCHOR SUPPORTS																																					
SUNKEN RAISED SLEEVES/INSETS																																					
BROKEN LOOSE BARS/POSTS																																					
JAGGED EXPOSED EDGES/NUTS/BOLTS																																					
FRAYED WORN OUT TORN STOLEN																																					
LOOSE MISSING BOLTS/NUTS/CONNECTORS																																					
BROKEN WELDS																																					
LOOSE BROKEN STEPS/RUNGS/BARS																																					
SPLINTERED ROTTEN WOOD																																					
OPEN WORN LINKS/CHAIN																																					
BENT PROTRUDING WIRE																																					
JAGGED BROKEN METAL/WOOD/FENCING																																					
EXPOSED ELECTRICAL FIXTURES																																					
OTHER (LIST)																																					
OTHER (LIST)																																					
OTHER (LIST)																																					
THIS EQUIPMENT INSPECTED																																					

School _____ Signature of Originator _____ Date _____

Figure 1. Sample form for recording needed repairs

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BEVERLY HILLS ELEMENTARY SCHOOL
Franklin County Public Schools
Potomawk, Maryland 20850

Dear Parent or Guardian:

We have made many efforts to ensure a safe playground for your child. We provide supervision of children whenever they are at play outside. The maintenance division completed a project to install a safety surface under the playground equipment. Teachers include safety instruction at each grade level. Students are instructed as to which pieces of equipment are appropriate for their age group and how to use that equipment. Our safety committee monitors school accidents and recommends changes or modifications in activities.

However, participation in some playground activities may result in injury to your child. Although precautions are being taken to protect your child's safety, U. S. Consumer Products Safety Commission reports indicate that children are injured by falls from playground equipment during normal play. Some of these injuries may be severe.

If you have any questions or suggestions, please call the school principal, Ms. Sarah Winslow, at 279-3146, or the school system safety director, Mr. Fenton Harris, at 279-3147.

Please sign and detach the bottom section of this letter and return it to your child's teacher.

Although my signature does not constitute a release of the school from the responsibility of supervising my child responsibly, my signature indicates that I have read this letter and understand the risks for my child.

_____ Signature _____ Date

_____ Child's (Children's) Name(s)

Figure 2. Sample letter to parent

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19

Racquet Sports

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Racquet sport participation continues to grow at a rapid pace. The injuries associated with these lifetime sports represent increases that are proportional to the growing participation. The most common serious injuries in racquet sports have been to the eye, elbow, and shoulder and the strains and sprains related to poor conditioning and/or failure to warm up properly. Specifically, direct eye damage from the ball, eye and facial damage from the racquet, tennis elbow, rotator cuff tears, and swing related bursitis and arthritis collectively form the primary concerns for the racquet sport player.

Proper supervision in racquet sports requires adequate planning, risk management strategies, prudent judgment, and elimination of site/equipment hazards. The participant should receive warnings of the inherent dangers of the activity and any specific site hazards. Initially, pre-activity warnings should be followed by regular oral reminders and posted visual aids containing safety measures presented at the level of the participants.

The playing environment should be inspected regularly to ensure that the playing surface is free of hazards, the playing courts are free of maintenance or design problems, and the equipment is in good condition. Racquetball and squash courts should have unobstructed walls and floors with secure footing. Badminton and tennis courts should be planned with adequate space around the court to play the game safely and to provide for safe access between the courts for players and observers.

The activity curriculum should be educationally sound. One characteristic of good teaching is the identification of and provision for a learning progression. Racquet sports require proper throwing mechanics that can transfer

to hitting mechanics. The participants should demonstrate physical readiness in all developmental areas. Physical readiness should include proper warm-up, satisfactory health, demonstrated fitness levels, demonstrated performance in prerequisite neuromuscular skills, and proper post-activity cool-down routines.

Psychological readiness indicates the player's ability to act responsibly in competitive situations, to enjoy the participation, and to grow from positive interactions with partners, opponents, and mentors.

Today, the greatest hazard in racquet sports appears to be the aspect of ocular injury. The National Society to Prevent Blindness reports that 10% of all sports related eye injuries are incurred in racquet sports. Badminton injuries are rare, but in Malaysia where it is a most popular sport, two-thirds of all reported injuries were to the eyes. Tennis balls measure from 6.25 to 6.56 cm in diameter and range in speed from 50 to 85 miles per hour as they cross the net. The size of the tennis ball makes it less likely to enter the eye socket, but the ball's texture and the dirt it collects make corneal abrasion more likely than from a racquetball.

Racquet related injuries in tennis and badminton are not as prevalent as in squash and racquetball, which may be due to the more confined area and multidirectional swing planes created by the four wall court games. Ball speeds in racquetball reach speeds in excess of 125 miles per hour. The smaller ball in squash (1.56–1.75 cm) and the more pliable racquetball fit into the orbit of the eye and create an increased probability of ocular injury. There are more injuries from the racquet in squash than in racquetball because of the greater racquet length and the somewhat shorter court.

Eyeguard lenses and frames have been the subject of considerable investigation. A review reveals the continual improvement of the protective devices and the conclusion that there is still room for improvement in design and materials. The weakness of the open eyeguards is that they do not prevent the penetration of a compressed ball between the rims into the orbit of the eye. Hardened glass, while more protective than regular glass, is still subject to shattering when the lens has been scratched. Plastic streetwear glasses are not generally break resistant in spite of widespread perception and practice to the contrary. The wrap-around eyeguards with lateral coverage and protective frame for the nose appear to provide safer protection than the open model.

Models utilizing a polycarbonate lens have been demonstrated to resist ball contacts up to 100 miles per hour. The polycarbonate lens has emerged as the material of choice for protective eyeguards. Polycarbonate is ten times stronger and one half of the weight of crown glass. Single prescriptions and tinted and fog-resistant lenses are now available on the market.

Safe lenses should meet the standards of the American Society of Testing and Materials (ASTM) and/or the Canadian Standards Association (CSA). The

Racket Sport Eye Guard Certification Council formed by manufacturers' representatives, ophthalmologists, physicians, and racket sport organizations certifies products that meet ASTM standards.

The open eyeguards, without lenses, have not been found safe because they permit ball penetration into the orbit of the eye from ball speeds as low as 50 miles per hour. The weakness of the bubble and wrap-around guards appears to be one of ventilation.

All of the eyeguards suffer from the perception of creating restricted peripheral vision, being unattractive, and/or being uncomfortable. It is because of these perceptions that players do not wear the guards and predictably it is the unprotected player who is injured most often. It has been determined that players generally will not voluntarily wear eyeguards. Players who have suffered previous injuries are the exceptions.

Experience in racquetball play does not seem to affect the probability of eye injury. One explanation suggests that novice players, while less controlled in their movement, tend to watch the front wall more. Better skilled players sometimes think they don't need eye protection because of their higher level of skill and knowledge, but it is precisely that game intelligence which allows them to track the ball at higher rates and concurrently increases probability of ball-induced eye injury.

Studies have indicated that racquet sports generate the second greatest risk of eye injury in sport. Only ice hockey ranks higher in incidence of eye injury. In racquet sports, over 90% of all eye injuries are caused by the ball. In recognition of the increase in racquet sport popularity and mounting probabilities of eye injuries, large organizations such as the United States military branches and the YMCA began mandating the wearing of eyeguards. Since the spread of this mandate in the early 1980s, the incidence of eye injury diminished in direct proportion to the adoption of the mandatory eyeguard policy. It behooves all teachers, coaches, and physicians to convince racquet sport participants to take the primary step in prevention of eye injury by wearing a polycarbonate lens guard.

A common safety problem in racquetball and squash occurs when the front court player faces the back wall as his/her opponent returns a shot. Another potential eye injury is a ricochet from a racquet and still another is the result of a ricochet off a back or side wall. Players should learn the concept of court awareness and make provision for an avoidable hinder in the event of any possible player danger.

In tennis, the probability of eye injury increases as the player approaches the net. The speed of the ball and the reduced reaction time are contributing factors in this instance. Ball speeds in racquet sports commonly range from 75 to 125 miles per hour; therefore corneal abrasions and orbital trauma are ever present risks.

The recurrent microstress of the elbow has been labeled as tennis elbow. This name is used even though probably less than 5% of those who suffer from it are actually tennis players. Tennis elbow is not a new problem; it was first described in medical journals in 1863. It is thought that approximately one-third of the players experience this condition at some point in their playing career Off-center hits, frequency of play, grip strength, string tension, grip size, racquet head size, court surface, shock from returning powerful strokes, and ball weight have all been related to the incidence of tennis elbow.

Proper swing mechanics are good preventative medicine for tennis elbow. The proper swing mechanics should include a backswing involving rotation of the trunk with upper arm close to the body and forearm in the pronated position. Upon impact and during the follow-through, the player should generate external rotation with shoulder abduction. As the trunk unwinds the elbow is extended while the racquet is held with a fixed wrist from a pronated forearm. The forward transfer of weight occurs with the forward momentum of the racquet head. The pronated position of the forearm is thought to be the most stable for the forearm. The two-handed backhand could reduce the incidence of tennis elbow by forcing the proper shoulder turn and spreading the shock of contact through both arms, thereby reducing the force on either arm.

A simple but effective grip change for players who extend their thumb parallel down the back of the grip while executing the backhand may reduce or eliminate tennis elbow symptoms. This grip causes a hyperextension of the thumb and sends an abnormal quantity of force to the lateral epicondyle which only increases or creates this chronic inflammation. The thumb should be comfortably wrapped around the grip and force generated by the wrist as it is pronated behind the point of racquet/ball contact.

While several factors have been positively related to the incidence of tennis elbow, the greatest relationship appears to exist with a too small grip size. While treatment of this painful injury has improved, preventive practices including using a larger grip size, increased warm-up, better stretching, forearm wraps, and counterforce braces are options that may offer the player a way to avoid the pain.

The incidence of shoulder injury in racquet sports is most common to the overhead stroke, primarily the serve, in tennis. Rotator cuff tears and subacromial impingement are two of the most common injuries related to this tendinitis related problem. The throwing action and the trauma of continued contact can aggravate this condition.

Common sense rules in regard to replacing fluids, pacing oneself, listening to one's body in instances of pain and fatigue, and wearing proper clothing and safety equipment are no less important in racquet sports than in any other activity. Proper conditioning for the specific sport is a prerequisite. Some more subtle areas of competitive safety include knowing the competitive hab-

its of your opponent, resisting the overly aggressive big play for the TV camera, and limiting matches to as few players as possible, knowing that cutthroat and doubles generally produce more injuries than singles.

Organizational control effected by quality supervision should be demonstrated by professionally trained personnel who can observe the playing area to determine that conduct and safety rules are followed. The planning should provide for reasonable participant/space ratios and practice formations should provide adequate space for swing planes and ball flight. Racquetball and squash courts are logically supervised from an elevated vantage point to provide an overall view, but the instruction generally must be communicated on a court-by-court basis that can create supervision concerns in the remainder of the courts.

In the open court activities of tennis and badminton, care should be taken to ensure intercourt space is sufficient to handle line play safely and to allow nonplayers to move safely. Nonplayers should be instructed as to when they may move and where they may remain while play is in session.

Rules should be established, communicated, frequently repeated, and prominently posted. The reading level of the rules should be established at the target level of the users. The rules must be modeled by the instructor and enforced unilaterally. Where special populations or conditions exist rules must be modified to match the ability to the participant. Printed handouts should be prepared and distributed to each student. While some individuals question the player's legal right not to wear protective eyeguards, there does seem to be a functioning consensus that a mandatory policy for children is in order.

The playing environment is a primary concern for the racquet sport instructor. The playing courts need to be free of all extraneous equipment, including maintenance and sports items. The playing surface should be flat, well-groomed, and its composition such that safe footing is provided. There should be no protrusions from side walls or fences, especially at player or racquet level. The court layout should provide for a safe playing area, adequate intercourt space, and ample baseline area off court. There should be a plan for players and observers to move to and from the playing courts. Facility guides give official court dimensions and suggestions for design of active court areas and the necessary inter- and off-court space.

Written policies and procedures should include the court maintenance procedures, safety inspection procedures, use policies, equipment maintenance procedures, and participant agreement forms. Court maintenance documents should reveal the surface treatment schedule, cleaning or clearing schedule, and the itemized maintenance checklist. The safety inspection procedures should include a timetable, key element precautions, and some indication of the personnel responsible for safety in the area. Use policies should indicate eligible users, conditions, risks, hours of use, and user responsibility. The equip-

ment should be checked regularly for deterioration, damage, and compliance with manufacturer maintenance suggestions. The participant agreement should include the primary risks, inherent safety concerns, and a place for the player or responsible adult to attest an awareness of the stated concerns and give consent to play with that understanding.

Tennis Elbow Checklist

Stroke Mechanics

Do
Use a two-hand backhand
Use a shoulder turn
Use a pronated forearm position
Don't
Lead with elbow on backhand
Swing with arm only
Use a supinated forearm stroke
Put thumb along posterior grip

Equipment Tips

Do
Use an oversized racquet (larger sweet spot)
Reduce string tension
Use the proper grip size (larger reduces wrist play)
Use a lightweight ball for practice
Use a forearm wrap

Playing Tips

Do
Play less frequently if tennis elbow symptoms appear
Play with an opponent who doesn't continually use "power" strokes
Increase grip strength and flexibility
Use a counterforce brace
Practice proper stroke mechanics
Gain and maintain proper conditioning
Play on softest surfaces possible

Treatment Notes

Do

Use anti-inflammatory medication as prescribed
Heat elbow prior to playing
Ice elbow with massage after playing
Wait — Surgery is generally not advocated until after a 6- to 9- month rest period followed by a rehabilitative exercise program and, possibly, prescribed injections. Surgery is not a first step.

Safety Rules List

Badminton

Equipment

Check racquets
- Proper string tension
- Safe grip
  - Tightly wound
  - Tacky/not slippery
- No loose, broken, or missing parts
  - Cracks in head
  - Cracks in shaft

Check shuttlecocks (birds)
- No sharp feather quills or sharp plastic protruding
- Balanced shape (proper flight symmetry)
- Proper weight for environment (indoor/outdoor)

Check net and standards
- Net secured properly
- Standards adequately weighted or anchored

Check court
- Floor clean and dry (adequate traction)
- Lines clearly marked
- Playing area free of extraneous equipment

Practice

Allow adequate space between players for swing formations
Allow for safe distance in stroke practice
Use fleece balls when appropriate
Stretch the major muscle groups generally and the upper arm and shoulder specifically

Game Situation
Match the players by ability
Provide recommended space around the court
Make eyeguards available for those who desire to use them
Assist the players in gaining and maintaining proper level of conditioning for competition

Racquetball and Squash

Equipment
Check racquet
- proper string tension
- safe grip — tightly wound; tacky/not slippery
- no loose, broken, or missing parts — cracks in head; cracks in shaft

Check wrist thong (racquetball only)
- test the tensile strength of the thong
- test the knot/connection of the thong

Provide and require eyeguards
- lens material (polycarbonate recommended; if CR-39 is used, require 3mm thickness at center; do not allow street eyewear for protection; do not use eyeguards without lens)
- type (use lens model; use wrap-around model; protect eyes and nose; avoid temple hinges)

Ball
- check for proper pressure
- keep ball clean and dry

Court
- check door for fit and security
- leave all nonessential equipment out of the court
- be sure the floor is clean and dry

Practice
Establish safe drills
- check swing room space for all drills
- check ball path for all drills
- establish ball retrieval strategy
- establish court communication responsibilities

Require eyeguards
Require thong (racquetball only)

Play
Require eyeguards

Stretch major muscle groups and specific swinging muscles
Avoid hinders; call hinders, if unavoidable
Play under control, don't be aggressive beyond skill level
Face the front wall
Swing under control
Use the wrist thong (racquetball only)
Use proper swing mechanics
Play the ball from low position to low target
Play singles rather than cutthroat (3 players) or doubles (4 players) and cutthroat rather than doubles to reduce risk from other players
Wear the proper shoes (thick soles)
Call warning "coming around" (back corner shot in squash only)
Use a short follow-through toward the front wall
Avoid contact with the walls
Communicate with partner and opponents
Don't misuse the loophole of playing the ball off an opponent
Gain and maintain the proper level of conditioning for competition
Avoid overswinging
Reduce or eliminate contact with walls/other players
Keep the ball, the grip, and playing surface dry

Tennis

Equipment
Check racquet
- check string tension (reduce for tennis elbow)
- grip characteristics (tightly wound; tacky/not slippery; proper size — increase for tennis elbow)
- head size (increase for tennis elbow)
- no loose, broken, or missing parts (cracked head; cracked throat; worn or broken strings)

Check balls
- proper pressure
- proper nap
- proper weight (reduce for tennis elbow)
- keep clean and dry

Check net and standards
- net secured properly
- standards adequately weighted or anchored

Check court
- surface clean, responsive, and level (slower for tennis elbow)
- lines clearly marked

sufficient border space around/between courts
Wear proper shoes
suitable tread
thick soles

Practice
Use proper stroke mechanics
Use safe formations
adequate swing room in drill formations
safe distance from ball in stroke formations
Stretch the major muscle groups generally and the upper arms and shoulders specifically

Play
Match the skill levels of the players
Approach the net only when under control
Use proper swing mechanics
Replace fluids
Stretch the major muscle groups generally and the upper arms and shoulders specifically
Play within skill and conditioning limits
Gain and maintain proper level of conditioning for competition

20

Self-defense

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Teaching a self-defense class in any setting requires strict observance of safety procedures. This principle is particularly true in the secondary school situation where students are in their adolescent years and are striving for recognition. In most physical education activities, recognition comes from excelling through execution of skills and contest performance. In self-defense classes, students are learning skills but they cannot use them with full force either in or out of class unless in a situation where their personal safety is jeopardized. Accepting this important concept is the base upon which safety in a self-defense class is built.

In self-defense classes, two components go hand in hand. One is mental preparedness and the other is the ability to perform a variety of techniques, often in a controlled manner, so as not to cause injury to another student. Therefore, an extensive amount of time in a self-defense class must be spent on developing an attitude that accepts the serious implications which this course has for every participant and the danger of many of the self-defense skills when used with full force.

A proper mind set must be established on the first day of a self-defense class and followed at each class meeting. Students are required to be aware of the dangers inherent in many of the skills learned and must be taught how these skills can be safely practiced in class. The challenge for a self-defense teacher is to teach skills that can be utilized at some future date in a situation where personal danger is present. It is sometimes difficult for an adolescent to internalize future benefits from a physical education activity when they are not even permitted to use full force when learning the skill.

The key is to instill in each student the proper attitude toward the activity. Students should have a different view of self-defense from their view of other activities included in a physical education program, which are learned to develop competency in performing an activity for recreational and/or competitive purposes. In self-defense it is hoped that the techniques learned will never need to be used.

Ingrain in your students an understanding of the serious consequences that can result if they approach the learning of self-defense skills in a flippant manner. They must accept the fact that the skills they are learning can cause serious injury, even death. It is imperative, therefore, that they follow all safety precautions established in the class.

As part of the instructional approach, the teaching emphasis will be that self-defense skills are to be used only as a last resort technique. Avoidance of dangerous situations, fleeing when threatened, and discouraging an assailant must precede the use of physical force. This concept is important for students to accept if they are to participate safely. A macho attitude has no place in a self-defense class.

The tenor of the class should be cooperation in developing skills, not competing against another person. The skills are being developed for protection. Practice can be safe, even though the techniques will be damaging to an assailant if they are used in a life-threatening situation.

Classes should be structured to maximize safeguards against injury. Many physical skills such as falling, striking, and throwing are incorporated into self-defense skills. It is important for the safety of the students that they develop a good kinesthetic awareness, particularly before practicing some of the advanced techniques. Students who know how to fall properly, know basic tumbling techniques, and gain confidence in their physical ability not only will be able to better defend themselves, but also will be able to participate safely in a self-defense class.

Supervision

The possibility of injury will be significantly reduced by following appropriate supervisory procedures. Both general and specific supervision has to be present. A proper class setting has the entire class in view of the instructor. Safety procedures established for the class must be understood and followed by every member of the class. Established practice procedures must be adhered to at all times and individual assistance will be provided when difficult skills are being learned. It is mandatory that skills of a sequential nature be learned step by step so the instructor can make corrections and assist in proper positioning and techniques throughout the execution of the skill.

Strict class control is critical for this activity because many of the skills that are being learned are designed to disable an antagonist. It is necessary to enforce practice procedures that provide safety for all participants in the class. An improperly executed technique could injure either the student practicing the skill or the student who is in the role of the attacker.

Aggressiveness must be controlled when practicing dangerous tactics. Blows, striking, and kicking must never be done at full force against another member of the class. Dummies, or other items such as pillows, should be used in a simulated attack situation when force is necessary to get the "feel" of proper execution of a self-defense skill.

Appropriate instructor supervision requires the following:

1. An instructor must be in the activity area at all times when students are present.
2. An activity area that provides an unobstructed view of all participants is important.
3. The instructor must be aware of each student throughout the class.
4. The instructor should be with students who are trying difficult skills for the first time.
5. The instructor should be knowledgeable in all the skills that are being taught and ensure that proper progressions are being followed.
6. Students should practice only the skills designated by the teacher.
7. Students should be taught how to assist their partners when practicing skills. Student understanding of the intricacies and dangers of the skills will increase overall class safety and assist the instructor in carrying out supervisory responsibilities.
8. It is important that the instructor knows the capabilities of each student in the class and adjusts class requirements to the psychological and motor readiness of the students.
9. It is important that students are comfortable with the instructor and are willing to seek assistance when needed.
10. Secure the instructional area when class is not in session.
11. Students should be permitted to practice self-defense techniques only in properly matted areas.
12. Safety procedures should be included in the class syllabus and these procedures should be given to the students.
13. Class safety procedures should be emphasized on a regular basis.
14. Detailed lesson plans should be prepared and followed during each class period.
15. Potential dangers, both in the environmental setting for the class and in the class presentation, should be eliminated as part of the class planning process.

Selection and Conduct of Activities

Self-defense tactics are designed for protection from a violent action and to thwart an attacker; they are not governed by rules designed for safe participation. It is particularly important, therefore, that the activity be conducted using specialized safety procedures. This poses an interesting dichotomy. Skills are selected because of their potential to disable an attacker, and yet the teaching procedures must be designed to provide extra protection to make the learning process safe.

The self-defense skill that is being learned will dictate the safety procedure that should be followed. Certain guidelines apply at all times and others are specific to specialized tactics such as delivering a blow or throwing an attacker.

General

1. Each session should begin with warm-ups. Many self-defense tactics require explosive action and sudden movements. Warm-up is important to prevent muscle pulls and ready the body for strenuous activity.
2. Students must be physically capable of handling the rigors of executing self-defense techniques. A physical fitness unit is a good preliminary step to starting a self-defense class.
3. Incorporate physical fitness into your self-defense unit so the students will have strength, flexibility, and muscle suppleness to minimize the possibility of injury.
4. Competency in basic tumbling skills is a prerequisite to learning falling and throwing techniques. Students should, at a minimum, be able to do forward, backward, shoulder, and forward dive rolls.
5. A key ingredient for successfully defending oneself when confronted with an attacker is to have confidence in one's mental and physical abilities. It is, therefore, important to spend class time on psychological preparedness as well as on developing physical skills. Many students have limited understanding of either their physical or mental capabilities. By incorporating motor skill and physical fitness activities, students will gain greater confidence in themselves and their ability to survive in a dangerous situation.
6. Tapping is the universal signal to stop. This signal must be respected by all members of the class and the hold broken immediately if a participant taps the mat, partner, or herself/himself.
7. Establish safety rules and make sure the rules are understood and followed.

8. Emphasis should not be on trying to prove that moves work, but rather on learning the techniques.
9. Proper progression is important. Start with basic skills and use these as the basis for more advanced techniques.
10. Regularly review basic skills to develop a firm foundation for the more difficult self-defense tactics.
11. Demand that students follow instruction consistently. Horseplay cannot be condoned.
12. The only techniques that should include contact with a partner are those which do not involve inherent risk of injury.
13. Practice in a large area on surfaces having at least the resiliency of a wrestling mat.
14. The instructor should be able to demonstrate each skill that is being taught. It is important that the instructor know the dangers of each skill and be able to effectively impart this information to the students.
15. Work slowly when learning techniques. The skill must be learned before fast movements can be controlled during practice. Speed should be increased only as control is developed.
16. Never force a student to attempt a skill. Be sure the student has the necessary background before moving to new skills.
17. Do not permit the wearing of jewelry or other accessories during a self-defense class.
18. Comfortable physical education clothing that does not have buckles, snaps, or other items that can cause injury should be worn. Sneakers are the recommended footwear.
19. Safety and emergency procedures must be established and understood by the students. There should be access to a telephone and emergency numbers should be posted.

Blows

1. Do not allow physical contact with a partner. This includes hand and foot blows.
2. Use padded dummies and other safe substitute targets such as rolled sleeping bags and playground balls when practicing blows.
3. Use imaginary opponents when using full force.
4. Make extensive use of simulation drills when practicing the various blows.
5. Emphasize the destructive nature of the blows that are being learned and the importance of treating dangerous techniques with respect.
6. Remember: never try to prove that a disabling blow works. Emphasize learning correct techniques for maximum effect.

Holds

1. Never allow students to apply full force to a hold.
2. Do not allow the use of fast or jerky motions on an unsuspecting partner.
3. Be sure the partner is aware of the hold and knows how to react to prevent injury.
4. Instruct the class members to always go with the leverage when a hold is being applied.
5. Stop immediately when one partner taps to indicate pain.

Falling

1. Be sure that the students know how to do forward, backward, shoulder, and forward dive rolls before teaching falls.
2. Practice on thick mats to protect from injury.
3. Develop proper form by practicing each fall slowly. Speed up as the proper technique is learned. Learn the correct procedures to minimize impact when landing on the mat.
4. Follow proper progression when learning to fall.
5. Start falling from a low position (kneeling or squatting) and gradually increase the distance until the fall can be executed from a standing position.

Throws

1. Students should be thrown only after they have learned falling techniques and are able to fall correctly.
2. Simulate the throws many times before using a partner. Learn proper throwing techniques thoroughly.
3. Partners should be of a weight that the student can safely control when learning a throw.
4. Gradually increase the size of opponents as a student's skill increases.
5. Control skills are exceptionally important when making throws Participants must be able to control their partner's body when throwing her/him to the mat. Throws should be executed gently and never with full force.
6. Instruct students as to when they should release their grip to prevent a partner from falling incorrectly.
7. Gradually increase the pace of the throws.
8. Make certain that there is a minimum of 75 square feet per pair of students when practicing throws. Other students must stay away from this area when throws are being practiced.

Environmental Conditions

Self-defense is a combative activity that requires an environment which will protect the participants when they fall or are thrown. Due to the vigorous nature of the activity, special consideration must be given to the floor surface that is provided. It is also valuable to have sufficient space so all members of the class can be practicing at the same time when the skills are being taught and practiced. Having a safe surrounding is the major consideration, but having a pleasant, clean class area also makes an important contribution to establishing a positive learning environment for self-defence.

Physical surroundings

1. An unobstructed matted area is needed. It is recommended that the mat have the resiliency of at least a wrestling mat.
2. The size of the class will determine the mat size that is needed. It is recommended that there be 45 square feet of mat surface for each student in the class. A minimum of 75 square feet per pair of students is needed when practicing throws. Class members and/or room size may necessitate rotating groups to provide appropriate safety parameters.
3. Ten foot circles, such as those painted on some practice wrestling mats, are ideal to use to keep satisfactory space between groups when practicing.
4. Wrestling rooms which have padded walls make good locations for teaching self-defense classes.
5. It is best to have one complete mat with the different sections taped together. Do not have small individual mats placed on the floor.
6. Any obstructions in the self-defense practice area should be matted.
7. Extra mats, including those of 6" and 8" in thickness, should be available when practicing falls and throws.
8. The mat area must be cleaned regularly.

Equipment

1. Partially deflated volleyballs and playground balls with target areas marked on them should be available for practicing various blows.
2. Punching bags, hand pads, blocking shields, tackling dummies, pillows, and rolled sleeping bags are examples of equipment that should be available for students to use when practicing.
3. A collection of items that are commonly carried or available in emergency situations should be available for demonstration purposes when teaching

self-defense. Examples would be rat-tailed combs, car keys, purses, belts, flashlights, and books that can be used effectively as a defensive weapon.

4. A storage room or section of a room is needed to permit the accumulation of equipment that can be used when teaching self-defense.
5. Appropriate videotapes, films, and slides are effective aids to use when teaching self-defense.
6. Check all practice equipment, including floor and wall mats, on a regular basis to make certain they are in good condition and safe to use.
7. Rules of conduct and safety and emergency procedures should be clearly posted in the practice area.

Self-defense techniques are valuable skills for students to learn. Even though the emphasis of this class is different from other physical education classes which emphasize developing skills that can be enjoyed competitively or recreationally, self-defense instruction makes a significant contribution to students' educational programs by incorporating an advanced level of kinesthetic awareness which translates into an expanded level of self-confidence. This confidence prepares them to handle dangerous situations through mental preparedness as well as specific physical skills. It is important, however, that the safety guidelines covered in this chapter be followed so this physical education experience will be safe and beneficial.

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Soccer

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Called the world's most popular sport, soccer, as we know it, is not as foreign to the Americas as one might think. Written reports from Boston during the 1600s refer to soccer, and actually ban it from being played in the streets due to the injuries incurred by the participants. As the years progressed, soccer went through various modifications tending toward the more violent forms of rugby and American football. These setbacks were eventually overcome with President Theodore Roosevelt's White House conference aimed at curbing the American form of violent rugby-football, and with increasing contact with Europeans and other peoples of the world. Soccer has slowly and steadily made its way into the ranks of a national sport. Today, the soccer rebirth in the United States is phenomenal. Youths from coast to coast are playing this relatively simple team sport and parents are enjoying the advantages of watching their children engage in a sport that is healthy for their bodies and relatively gentle on the pocketbook.

When you have a game where little equipment is used and successful play depends primarily on body stamina, injuries will happen. Following is a list of common soccer injuries, the body parts most often affected, and suggestions for their prevention.

Common Soccer Injuries

Abrasions — scraping of the skin
Area most affected
All parts of the body, especially the legs
Prevention
Use safe and well-maintained equipment
Avoid unsafe playing areas
Avoid dangerous play

Contusions — bruising of the skin and underlying tissue
Area most affected
All parts, especially the quadriceps
Prevention
Avoid dangerous collisions

Blisters
Area most affected
Feet
Prevention
Conditioning of feet
Properly fitting shoes
Wearing two pair of socks
Tape over the tender areas
Use lubricant on friction area
Use powder to reduce moisture

Strain — damage to tendon or muscle caused by overuse or overstress
Area most affected
Lower extremities, especially the gastrocnemius muscle, Achilles tendon, and patellar tendon
Prevention
Adequate fitness training
Sufficient warm-up
Restrictive taping

Sprain — stretching or tearing of ligament beyond its normal limits
Area most affected
Ankle and knee areas
Prevention
Adequate fitness training
Sufficient warm-up

Restrictive taping
Use of braces
Avoid dangerous situations

Heat exhaustion — rapid, weak pulse, light-headedness, faintness, profuse sweating, disorientation

Prevention

Adequate fitness training
Regular water breaks every 15 to 20 minutes
Plenty of water before play begins
Don't play in excessive heat and humidity

As in any sport, soccer does have its injuries, but many can be minimized by proper attention to safety standards set by the instructor.

Supervision

1. Proper attention should be given to the health status of the students; have them complete a health form.
   a. Be aware of present physical problems such as fractures, sprains, etc.
   b. Be aware of health history, e.g., diabetes, allergies, asthma, etc.
2. Medical equipment should be available at all times.
   a. First aid kits should be available including telephone numbers of the police, ambulance, rescue squad, etc.
3. If an injury occurs, the teacher should provide first aid only.
   a. First aid training should be a must.
   b. Never diagnose unless qualified.
   c. Never permit the student to play through pain; let pain be the guide. Pain is nature's way of telling us something is wrong and to continue playing would only aggravate the situation.
4. Never allow a student who has had a serious illness or injury to rejoin class without a written note from the doctor.
5. Record the nature, circumstances, time, date, treatment, and follow-up of all injuries.
6. Never allow students to be without supervision while in the gymnasium or on the field.
7. No climbing or hanging from the nets or goal posts should be allowed.
8. Encourage good sportsmanship within the classroom structure. Stress the development of student self-control during competition.
9. Officiate games or instruct others to officiate as fairly as possible with safety of the students in mind.

10. Adapt the rules to the age and skill level of the students.
11. Constantly stress the rules of soccer with the realization that safety is promoted through rules.
12. Consider the weather and its effect on the field in the decision to go outside or remain inside. A wet field can be extremely slippery and lead to unnecessary injuries.

Lesson Plans

1. Since soccer is aerobic in nature, begin each lesson with warm-up activities and conclude with a cool-down.
   a. Warm-up — slow stretching exercises, no ballistic type. A thorough warm-up stretches all parts of the body to prepare for activity, stimulates the body systems, and diminishes the chance of injury.
   b. Cool-down — exercises that gradually slow activity after intense exertion speed recovery time for the body and return the circulatory system to pre-exercise state.
2. Be aware of the conditioning and fitness level of your students. Soccer is an endurance sport. Consider having a fitness and conditioning unit before the soccer unit. Incorporate fitness and conditioning into your soccer unit lesson plans. Develop strength, endurance, and flexibility in the areas most vulnerable to injury.
3. Stress the proper progression of skills, to include:
   a. Fundamental technique. Learn and practice skills with little or no movement around the field.
   b. Match related skills. Perform learned skills with movement.
   c. Match conditions. Perform learned skills in a game situation.
4. Proper instruction of skills is a must. Explain the skills, demonstrate the skills, and make sure everyone understands the skills.
5. Analyze the drills and teaching methods used with students' safety utmost in mind.
6. Provide ways and methods of practicing skills that are fun and motivating. This ensures proper learning of skills and better body and ball control.
7. Provide ample feedback to the students regarding their technique. Allow sufficient practice time to improve skills.
8. The maximum number of students per team should be kept as close to the rules (11) as possible allowing for less confusion and injury during play. The United States Youth Soccer Association recommends smaller team numbers of younger players. Instead of 11 vs. 11, play 6 vs. 6 or 7 vs. 7.

A teacher's responsibility for safety extends beyond the actual lesson or play to involve the equipment and environment in which the instruction takes place.

Equipment

1. Shirts
   a. Shirts or scrimmage vests should be of different colors for each team. This prevents confusion and helps prevent collisions.
2. Shoes
   a. Sneakers should be used for indoor play.
   b. The following alternatives apply when playing outdoors: sneakers; all purpose athletic shoes; soccer shoes with molded cleats. All of the above are soft types of shoes to keep injuries to a minimum. Cleated shoes are ideal because they provide better traction and less slipping.
3. Shinguards
   a. Shinguards are a must for classroom competition. They provide safety by decreasing injuries in the shin area.
   b. Shinguards come in several sizes and should be sized to fit the students.
4. Goalie uniform
   a. Suggest wearing a long-sleeved and long-legged outfit (sweat suit) of a different color from the team shirt. A long-sleeved and long-legged outfit will protect the goalie from abrasions and contusions while diving for the ball. The different color shirt will help other players recognize the goalie.
5. Soccer ball
   a. The ball should be sized to fit the age of the students for better ball control (see Table 1). It should be inflated to the recommended pressure for proper ball control and less injury to the body when heading and collecting.

Table 1
Recommended Ball Sizes

Age	*Ball Size*	*Circumference*	*Weight*
Players under 6 yrs.	#3	23"–24"	8 to 10 ounces
Players 6 yrs. to 11 yrs.	#4	25"–26"	11 to 13 ounces
Players 12 yrs. and over	#5	27"–28"	14 to 16 ounces

b. Use smaller, lighter balls for younger players. Table 1 gives recommendations for ball sizes for the various age groups.
c. The ball may be constructed of a variety of materials. For outdoor use, a leather or rubber coated ball (less expensive and more durable) is recommended. Indoors, an indoor soccer ball, nerf ball, or slightly deflated outdoor soccer ball or volleyball is appropriate.

Field

1. Size
   a. For players under 12 years of age, the use of a smaller field with smaller dimensions is highly recommended.
2. Playing area
   a. The grounds should be free of holes, ruts, glass, sticks, stones, etc.
   b. The goalposts should be free of hooks and protrusions and should be secure. There should be no loose bolts or connections.
   c. A reasonable buffer zone of unobstructed space should be maintained around the playing field.
   d. Daily inspection of the area before classes begin will protect students from unnecessary injury due to unsafe playing fields.

Prudent and reasonable care in following the safety rules outlined in the previous pages will help to prevent injuries in the soccer program. This is important not only for the safety of the students, but for the protection of the instructor against liability. Planning for safety is a prerequisite to any soccer program.

22

Softball

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Softball is truly one of our great national pastimes. In addition to the organized leagues sponsored by school systems and recreation departments, there are literally hundreds of thousands of "pick-up" games played each year. Indeed, beach parties, family picnics, company outings, and school field days are all fertile ground for a "couple of innings of ball."

Widespread participation in this sport, though, has its advantages and disadvantages in terms of safety. Active league play has resulted in numerous changes to rules, equipment, and playing field conditions that have contributed immeasurably to ensuring the safety and well-being of the player. Unfortunately, few of these improvements have filtered down to the "pick-up" game or in some cases the physical education class or intramural league. In these instances, familiarity with the sport seems to be our worst enemy in regard to safety.

Familiarity with softball appears to breed carelessness. While we insist on having gloves and catcher's masks worn at the varsity game on Friday afternoon, we sometimes find it a nuisance to require the same gear for players in our class on Friday morning. Why? Is one set of students at less risk than the other? The answer is obviously no. The only thing that is different is our attitude.

In our minds, the game played by the varsity is fraught with risk. Anything can happen when playing another team on another field. We view the games played in our classes, however, quite differently. What can happen? we ask ourselves. It's only a game for fun—it's only a "pick-up" game among friends. Are all the precautions necessary?

Yes, all the precautions are necessary—even among friends. Accidents can happen at any time. Our only defense is to be prepared. If we take safety lightly in our classes or during intramurals, we are doing our students a disservice in two ways. First, we place them at greater risk than need be, which speaks for itself. Second, and not as obvious, is that we instill in them a careless attitude about safety, which can be just as debilitating as asking them to catch without a mask.

Safety is everyone's responsibility, at all times. Whether we're coaching a sport, teaching a class, or playing a "pick-up" game of softball, taking precautions is part of the game.

Supervision

Supervision refers to the ability of the teacher or coach to monitor the activity that is occurring. Following are guidelines that should be kept in mind when planning for effective instructor supervision.

Quality and Quantity of Supervision Needed

Instruction in softball should only be provided by individuals who are knowledgeable in:

1. The rules of the sport, especially as it is played by the age group they are supervising
2. The mechanics of the skills, especially those which place a player at greater risk, such as sliding.
3. The teaching techniques which are used to provide safe instruction.
4. The teaching progressions for each skill, especially as they apply to the age and ability level of the players.
5. The potential hazards inherent in the sport.
6. The care and maintenance of equipment.
7. First aid and emergency procedures.

As a general rule, the ratio of students to teacher should be smaller when the students are beginners or when new and potentially hazardous skills, such as sliding or batting, are being taught. In these instances the teacher/coach can improve the teacher/student ratio by:

1. Dividing the group into small units, where each unit is given an assignment which can be safely self-directed. This should allow the teacher/coach to move from unit to unit to introduce the new skill under conditions which permit better supervision.

2. Teaching students to provide feedback on a skill. Students who are chosen for this task must be trained by the instructor to be sure they have a thorough knowledge of the subject matter. Providing student assistants with written material which they can use to provide feedback to the other students is also helpful.

Organization and Control

Instructors should station themselves at the area of highest risk. As a general rule, a high risk area can be defined as one in which a new skill is being learned, a highly complex skill is being learned or practiced, or a group of novices or poorly skilled players is practicing.

Be sure student assistants or managers are well instructed in the duties you expect them to perform. Two words of caution: student assistants should be reviewed periodically for effectiveness and they should never be asked to assume responsibilities for high risk areas.

Softball fields provide wide open areas. Instructors should be sure that the activities they are conducting are placed in such a way that:

1. They can see all players at all times.
2. They can get from one activity to the next with minimal time lost if there is an emergency or if specific discipline is required.

Instructors should move from activity to activity in such a way as to ensure full view of the group at all times. Generally this means moving along the perimeter of the field. Students should always be aware of the location of the instructor. If the area in which the activity is being conducted is large, the instructor may decide to:

1. Wear something that is brightly colored or distinctive so that he/she can be spotted easily.
2. Rotate the group through his/her location.
3. Announce a change of position before moving.

Bats, balls, or other equipment that may create an attractive nuisance for a player should not be left out if an instructor is not able to provide supervision.

Policies should be developed concerning potentially hazardous activities, e.g., sliding, baserunning, and catching. The policy should take into consideration:

1. The ability of the player.
2. The instruction provided.
3. The type of playing area provided.

4. The quality and quantity of supervision provided.
5. The type of softball game being played (e.g., fast pitch, slow pitch, 16-inch softball).

Safety rules that reflect the type of softball being played should be compiled and presented to the group at the beginning of the unit and reviewed periodically throughout the season. Figure 1 contains general rules which apply to all situations and should be included on any list of safety rules.

Planning

Detailed lesson plans should be written for every instructional period or workout session. Plans should include, but not be limited to:

1. Specific objectives which explain the purpose of the session and what the instructor hopes to accomplish.
2. Detailed explanations of the activities that have been selected to achieve the objectives.
3. Diagrams which illustrate the managerial aspects of the drills being taught or the organization of the group.

General Safety Rules for Softball

Do not begin practicing or drilling until the instructor/coach gives the signal to begin.

Check the area before swinging the bat. Be sure no one is near you.

Don't use the bat to hit stones or other objects. The bat should be used only to hit the ball.

When throwing to warm up, be sure you are throwing in the same direction as everyone else. Check to be sure no one could be hit by an overthrow.

There should only be two lines of throwers at any given time on the field.

Don't fake a tag on a player.

Remember that the fielder has the right of way in the baseline when fielding the ball.

When playing offense, stay well back from the playing field. If there is a fenced-in dugout, be sure to stay there until your turn at bat comes. Stay alert for foul balls that may be hit toward the bench.

Never leave equipment lying in either fair or foul territory.

Call for the ball — avoid collisions.

Figure 1. General safety rules that apply to all types of softball

4. Notations of any special safety considerations for the skills being taught.
5. Provisions for warm-up activities and review of prerequisite skills.

Lesson plans for rainy days should be prepared in advance. They should correspond to the activities being taught in the unit or outline an activity to be performed in lieu of the skills being taught in the unit because of limitations on space, equipment, etc. If a substitute activity is planned for a rainy day, the most important consideration is that the students can safely perform the activity at their present level of ability or conditioning.

Be sure planning reflects an understanding of the learner's level of ability and the limitations that might be placed on learning due to lack of equipment or facilities. Taken collectively, the lesson plans should reflect sound progressions for skill development.

Selection and Conduct of the Activity

Conduct of the activity refers to the proper selection of an activity or teaching method based on the size, age, ability level, and experience of the player. Following are several points which should be considered when searching for the most effective course of action in presenting or reviewing material with your students.

Readiness

One of the first areas to consider in the selection and conduct of activity is whether a player is likely to succeed (ready) when trying a new skill.

- Never force a player to attempt a skill if he/she is afraid or expresses unusual insecurity. This caution extends also to previously learned skills.
- Never force a player to assume a position on the field for which they have never had instruction or for which they express fear or uncertainty.
- Never allow individuals to play at a level for which they have insufficient skill. If a level of play requires that a player be able to slide for safety purposes do not allow individuals to play if they cannot slide.
- Stress self-control. Teach students to follow the rules and assume responsibility for their own safety. Teach them to check their equipment before they use it and to survey the playing field before they begin play. Have them remind each other of playing habits (e.g., dropping the bat). Make everyone safety conscious.
- Prepare the students for emergencies. Explain the potential hazards of the game and the methods for avoiding injury. Outline what should be done if an emergency occurs.

- Never engage the group in game play unless they are ready. Be sure you know what they are capable of doing safely. If you feel it important to play the game early in the instructional period, modify the rules and equipment so that the game conforms to the skill and ability of the players. Following are some suggestions for modifying the game.
  1. Modify equipment. Use a ball that is bigger, brighter in color, or softer. Use a longer or shorter bat, or one that is lighter in weight.
  2. Modify rules. Allow for:
     no balls and strikes
     one pitch or three pitches per batter
     pitcher from own team
     fewer bases
     hit ball off tee — no pitcher
     eliminate infield positions
     eliminate outfield positions
- Be sure the players are physically ready to play the game. Stress conditioning in the early stages of the season especially for the arm and shoulder girdle.
- Stress the need for warming up before practice or play. Teach the players a specific routine for warming up and explain the possible injuries that could result from inadequate warm-up activity.

Skill Progression

Progressions are one of the most important ways to ensure safety in any sport. A proper progression minimizes the likelihood of injury during the instructional phase and prepares the player for injury-free ball during the execution phase. Following are suggested progressions for several of the basic skills in softball.

Throwing

Throwing progressions should always begin with a light weight ball that is easy for a player to grip. As the player becomes more skilled, a larger, heavier ball may be substituted. Recognize, however, that a regulation ball may never be appropriate for some players. Before a regulation ball is substituted, consideration should be given to the age, size, and ability level of the player as well as the availability of gloves.

To ensure safety, throwing drills should always be set up so that (1) there is ample distance between throwing pairs/groups, (2) each pair is throwing in the same direction, and (3) throwing pairs never overlap.

Throwing progressions

1. Demonstration of proper mechanics of overhead throw.
2. Players practice mechanics of the throw without the ball.
3. Players throw short distances practicing mechanics.
4. Players throw short distances practicing accuracy.
5. Players increase distance, concentrating on accuracy and mechanics.
6. Players practice running to the ball, fielding, and throwing.
7. Players throw from different positions on the field starting with infield positions and progressing to outfield positions.

Catching

Catching progressions should always begin with a light weight ball that is large enough for the player to track easily. When working with very young players, it is a good idea to work with a ball that is brightly colored. As the catching ability of the player improves, a regulation ball can be substituted safely.

Note the precautions that apply to the placement of a throwing drill apply to catching as well. In addition, care should be taken to locate the catching drill on level ground. Grounders that take an irregular bounce are difficult and dangerous to field. Level ground will make it safer and easier for a player to catch the ball. It also minimizes the possibility of injury due to falling.

Catching progressions

1. Demonstration of mechanics of catching.
2. Players toss ball to themselves and catch.
3. Players throw ball to a wall and catch it on a rebound. Throws should be varied so that practice is gained catching balls that rebound at various heights and speeds.
4. Players toss and catch with each other. Practice should be gained:
   catching ball of varying heights
   catching balls thrown to the left and right of the midline
   moving to the ball
   moving backward
   moving laterally
   catching and throwing immediately to a target
5. Players field balls hit off a bat.

Batting

Batting should be practiced in a designated area that is large enough to allow the batter to pull the ball left or right or hit a foul without interfering with another drill or game. Each player involved in the batting drill should be as-

signed a specific task and positioned on the field in such a way as to eliminate the possibility of being struck by the bat. Using only one ball during batting practice is advised when working with novices. When providing instruction during the early stages of learning be sure to use a light weight bat and ball to practice. This procedure should be followed as much to protect the fielders, who may not be highly skilled catchers, as to make it easier for the batter to perfect his/her skill.

Another precaution which should be considered is using a light weight or "soft" ball (mush or cloth ball) when a batter is facing a live pitcher. This adaptation is suggested because of the dubious talent most young pitchers exhibit when trying to pitch the ball directly across the plate. If a ball strays from its intended path it is less likely to cause the batter injury if it is light weight or soft. During live pitching sessions don't forget to insist that the catcher wear a mask and other protective equipment. Live batting practice has all of the elements of a real game, and it requires all of the same precautions.

Batting progressions

1. Demonstration of the mechanics of the swing.
2. Using a light weight bat, learners practice swinging without a ball. Be sure the batters have ample room in which to execute the drill. Allow for the possibility of the bat flying off on the follow-through.
3. Players practice batting off a tee. Have the batters place their own ball on the tee. This will help to eliminate the possibility of a player being accidentally hit by a practice swing as he/she goes to place the ball on the tee for the batter.
4. Players practice batting with the coach or instructor pitching. Care should be taken in this drill to place the ball into play slowly so that the fielders have time to recover. The tendency is to concentrate on the batter, pitching the ball as soon as the stance is regained. This can create a dangerous situation for the players in the field; as they are concentrating on fielding one ball, another is launched into the air. It would be very easy in this instance for a player to be hit by an unseen ball or for two players to collide because they were paying attention to two different situations.
5. Players practice batting with another player pitching. Start this drill with a light weight ball. Remember that batting ability develops at a much faster pace than pitching ability. This can lead to two problems: first, the novice pitcher may inadvertently strike the batter with the ball; and second, the batter may hit a line drive back to the pitcher who, because of inexperience, is not ready to catch the ball. The effect of both of these situations can be reduced by the use of a light weight ball and a modified pitch.
6. Players practice batting with a pitcher who is throwing medium speed.

Baserunning

There are two primary areas of concern connected with baserunning drills. The first is the condition of the field where the runners are practicing. It should be free of holes, uneven surfaces, or any equipment or debris that may cause injury. It should also provide enough traction for the runners to accelerate safely without slipping and ample room for them to decelerate without fear of crashing into a wall, a fence, or some other immovable object.

The second condition focuses on the physical readiness of the players. Baserunning drills can be extremely tiring. As such they can be debilitating. Tired players don't worry about technique — they just want to get through a drill to save face. When the point of fatigue is reached, the likelihood of injury increases due to lack of concentration and inability to make the body perform correctly. To minimize the effect of fatigue, the instructor/coach should treat baserunning as a conditioning drill in the early stages of the unit or season. The number of times a runner is asked to perform should be based on physical condition, not on mastery of technique. As time progresses and the player's physical condition improves, more emphasis can be placed on proper form, with less regard to the number of times the player is asked to round the bases.

The following steps should be performed at a moderate speed while technique is being learned. As technique improves, maximum speed and acceleration should be the goal.

Baserunning progressions

1. Players practice sprinting to check form.
2. Players practice running straight through the base.
3. Players practice swinging, dropping the bat, running through base.
4. Players practice rounding bases.
5. Players practice swinging and running for double, triple, homerun.
6. Players practice picking up coach's signal, before leaving the base, as approach to base is made.

Sliding

Sliding is a technique for advanced players who have the ability to execute it properly. It is not a skill that should be taught to an entire physical education class. It is a skill, however, that should be taught, reviewed, and conscientiously practiced with varsity players who may need to execute the skill to avoid injury. Even in a varsity situation, though, it should be recognized that there will be players who are afraid to slide. The coach has only two choices with these individuals: either never ask them to slide or, if he/she feels it is a crucial skill at their level of play, cut them from the team. A player who is

afraid must never be required to slide. It is a request that most surely will increase the chances of injury for the player.

A progression on sliding is not included in this section. Rather, several precautions are listed which should be considered when teaching the skill to advanced players.

Sliding precautions

1. Perform learning stages of skill in sand pit or on a very grassy surface.
2. Have performers learn the skill in sneakers before using cleats.
3. Use loose or throw-down bases until the skill is perfected.
4. Do not have a baseman present until the skill is perfected.
5. Break the skill into manageable parts when teaching.

Environmental Conditions

When planning for safety in softball, the instructor must consider two major aspects of the environment in which the unit will be conducted: field preparation and layout and equipment maintenance. (Where specifications are given, refer to the National Federation of State High School Associations *Softball Rulebook*.)

Field Layout

The following guidelines are written for a regulation softball field. It is clearly understood, however, that most of the softball being played today, outside of structured league play, is being played on makeshift fields. Where applicable, a standard is modified to address this situation.

Infield. The infield shall be a skinned surface, free of rocks, grass, weeds, potholes, or foreign debris. If a skinned infield is not available, the area should be checked for irregular surfaces or holes.

Markings. All markings on the field, including foul lines, batter's box, etc., shall be marked with a material that is not injurious to the eyes or skin. Materials such as lime are prohibited.

Outfield. The outfield shall extend unobstructed at least 200 feet from homeplate for male and female fast pitch, 250 feet for female slow pitch, and 275 feet for male slow pitch. It should be free of all rocks, holes, and debris.

Orientation. Where possible, the field should be positioned so that a line running from home plate through second base points in an east-northeast direction.

Warning Track. If a field is bounded by a fence, the fence shall be at least 8 feet high. To warn the fielder of his or her approach to the fence, there shall be a track of a different surface from the outfield grass.

Dugouts. Where dugouts are not provided, an area shall be designated for player seating at least 25 feet out from the foul line

Backstops. Backstops should be positioned not less than 25 feet behind home plate. If backstops are not in use, no one shall be allowed to sit or stand behind the catcher.

Equipment

Following is a safety checklist for equipment. The list in no way implies that every piece of equipment is required in order to conduct a safe program. The type of equipment needed will be dictated by the game played and the age and ability level of the players. The list does, however, represent a set of conditions which should be present if the equipment is used. (Technical specifications such as weight, length, etc. of specific pieces of equipment when used reflect the rules governing high school Federation ball at the time of this writing.)

Bat

1. The bat should be round and a one-piece construction of hard wood, metal, or plastic. Bats of two-piece construction, in which the barrel and the handle are separate units, are unsafe and should not be used.
2. The proper weight and length of a bat will vary with the age and ability level of the player. At its maximum, the bat should not exceed 34 inches in length. Fungo bats should not be used in regulation play.
3. The bat should have a safety grip made of a rough surfaced material. Smooth surfaced grips made of plastic tape are unsafe. Grips should be checked for tears and slippage. Damaged grips should be replaced immediately. If the repair cannot be made at once, the bat should be removed from play.
4. Wooden bats should be checked for cracks and splinters. Bats with cracks and splinters are unsafe and should be removed.
5. Every bat should have a safety knob at the end. If the knob is damaged, the bat should be replaced.
6. Donut rings are not recommended for use on softball bats. Do not allow them to be used at any time.

Ball

1. The proper size and weight of the ball will depend on the game being played and the age and ability level of the players. It will also depend on

whether gloves are available for all the players and whether the game is being played indoors or out. Be sure to use a ball for the purpose for which it was intended. If you decide to use a ball in a situation where it is not normally used, be sure you have sound educational justification for doing so.

2. Balls should be checked regularly to be sure they meet specifications. Those that are misshapen, have torn seams, or are water logged should be discarded.

Gloves

1. The decision to use gloves will depend on the type of game being played. Anytime a regulation size and weight softball(6 ¼–7 ounces in weight, 11 ⅞–12 ⅛ inches in circumference) with standard firmness is used, gloves should be worn for protection.
2. Be sure that the gloves issued are appropriate for the position.
3. Check laces to be sure they are not broken or worn. Worn or broken laces should be repaired immediately or the glove should be removed from play.
4. Work the gloves to be sure they are supple. Gloves that are stiff do not afford the player sufficient control.
5. Be sure gloves are properly fitted for the size of the player's hand.

Headgear

Headgear is required for use in all varsity situations that are governed by the National Federation of State High School Associations. According to the rules: "It is mandatory for each batter, runner, and the catcher to wear a head protector. The head protector shall be a type which has safety features equal to or greater than those provided by the full plastic cap with padding on the inside. The head protector worn by each batter and each runner shall have extended ear flaps which cover both ears and temples...." In a class situation, where students do not wear ball caps, sanitary precautions preclude the use of headgear. Measures to protect the batter, runner, and catcher in this situation should occur, including rule modification if necessary.

Catcher's Equipment

In addition to headgear, the catcher in a varsity situation may be required to wear some or all of the following equipment. Again, the exact choices will differ depending on the game played, the rules that are being enforced, and the ball and bat being used.

1. Mask. If the catcher wears a head protector be sure the mask is compatible with the protector. Check straps to be sure they adjust for tight fit. Have masks of varying sizes or adjustable pads to ensure a snug fit around face. Have the catcher check mask to be sure visibility is not impeded. Check the wire frame for dents or openings that may give upon impact with ball. Under no circumstances should a catcher be allowed to take a position immediately behind a batter without a catcher's mask.
2. Chest protector. Secure appropriate protectors for each sex. Do not allow players to alter equipment in any way. Check the straps for wear and tear. Be sure protector provides snug fit without restricting movement in any way.
3. Shin guards. Be sure guards are capable of covering lower thigh, knee, shin, instep, and ankles. Straps should be adjusted for a tight fit. Be sure buckles fit on the outside of the leg once the buckles are tightened and in place.

Bases and Home Plate

1. Peg down bases. Use two pegs and straps to anchor each base. Be sure anchor pegs are placed away from baserunner's sliding path. Permanently anchored bases are inappropriate for use in situations where players who lack high level sliding skills are allowed to slide.
2. Homeplate. Edges should be flat and even with the infield playing surface. If the plate has protruding pegs on its top surface, it should be replaced. Homeplate should be made of a smooth-surfaced material.

Softball refers to many different games, each of which has its own special concerns in terms of safety. The best advice, when conducting any one of the softball-type games, is that the coach/instructor should consider every aspect of the activity from a high risk point of view and then initiate the precautions necessary to eliminate the likelihood of an accident.

23

Track and Field

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There are many approaches to the development of a safe environment in track and field. The literature is replete with specific recommendations which are essential to provide a safe environment for individual activities. There is, however, less discussion about the total environment in track and field — a sport in which multiple events are the core of competition.

Of equal significance to the provision of a safe environment in track and field is a basic understanding of the multiple events. Therefore, safety in track and field is tied to demonstrated knowledge of the coach or teacher.

It is generally agreed that knowledgeable and sensitive leaders can produce motivation to achievement, enjoyment, self-fulfillment, and improved skills if the athletic experience is conducted in a safe environment. Safety in track and field demands attention to the performance of the specific events. However, to guarantee the overall safety in multi-event competition, other factors must be considered.

General Safety Rules

The following general safety rules must be adhered to by the leaders and participants alike.

1. In view of the fact that many activities are conducted at the same time, it is imperative to look around before walking onto the track to avoid walking into the path of a runner or hurdler.

2. Before walking into the throwing area, look to see that the throwing circles are not occupied.
3. If jumpers are on the runway, do not walk into the path of a jumper.
4. If a participant is preparing to throw, look first to see that the area is clear.
5 Do not throw implements back toward the throwing circles.
6. If walking during a recovery phase of a workout, move either to the outside lane or completely off the track.
7. Do not leave implements on the track or on the field which may trip a performer.

There are a number of additional factors which must be observed in safety in track and field. Among them are (1) equipment safety, (2) selection of clothing, (3) running surfaces, and (4) training format.

Equipment safety. The quality and quantity of equipment (and supplies) available for instruction influence the safety factor in track and field.

Clothing. Track and field athletes participate in a variety of weather conditions including heat, cold, and rain. It is also necessary to wear support gear in some events. Participants should avoid support garments that restrict movement.

It is important to avoid wearing rubberized or plastic clothing. Increased sweating does not cause permanent weight loss. The rubberized or plastic clothing does not allow body sweat to evaporate. Excessive dehydration and salt loss may eventually lead to heat stroke and heat exhaustion.

A variety of shoes are required to service participants in the multiple events of track and field. Shoes for running are of different construction from those intended for field events. Since the athletes are of varying body build, the shoes must be pliable, properly fitted, provide for excellent support, and fit firmly but not too tightly.

Running surface. It is a "safety must" to avoid constant work on hard synthetic surfaces which lead to foot and leg problems. However, the surface itself may not create as much a problem for the athlete as improper foot strike. The coach must be aware of the proper foot strike for various events and train the athlete appropriately.

Training format. A series of factors must be considered in developing safety control in track and field. Among the factors are mode, frequency, duration, and intensity of training.

Mode. It is always best to utilize conditioning or preconditioning activities prior to competition. The selection of activity may vary but should focus on cardiovascular endurance (walking, jogging, running).

Frequency. This factor is important but less critical than duration and intensity. In developing a margin of safety, the coach must develop a training regimen which creates and exercises habit.

Duration. Research reveals that a safe approach to duration is to modify the length of performance according to the maturational level of the athlete. In general, 20–30 minutes of intense training per activity category provides the greatest return for the time invested.

Intensity. In viewing a safe approach to training, it is recommended that the athlete generally work at 60–80% capacity.

Basic Laws of Safety in Track and Field

Safety in track and field demands that several basic laws be followed to guarantee a margin of safety in training.

Flexibility training is critical to safe participation and demands adherence to the following principles.

1. Specificity — flexibility training must focus on joint action and the demands of the event, e.g., running vs. throwing or jumping.
2. Overloads — gains in flexibility take place when the participant achieves the limit of existing range regularly, thus allowing new limits to be set.
3. Reversibility — improvement in flexibility will be lost if regular work is not maintained.

In the attempt to achieve greater safety in training, several pitfalls must be avoided.

1. Insufficient warm-up. Training with weight without warm-up causes many injuries.
2. Overtraining. This occurs when the body is being worked so vigorously that it does not have time to repair itself.
3. Hard training sessions before a competition.
4. Weight training too often.
5. Increasing body weight without an appropriate increase in strength.
6. Increasing bulk to the point of restricting movement.

Safety in Training for Specific Events

Sprints. It is imperative to develop a balance between strength-building exercise and high repetition movements for greater endurance and improvement in coordination. Speed enhancement in sprinting can be safely pursued by developing both coordination and strength.

Hurdles. The hurdles event demands very serious attention to safety considerations because of the dangers inherent in the event. There must be a

verification of the technical preparation of the hurdlers, their coordination, boldness, and rhythm.

To avoid injury caused by faulty hurdle clearance, the hurdlers must have the necessary physical and psychological preparation. Critical to the safety of the participants are: basic training for muscle efficiency stamina and flexibility; belief in the ability to undertake stride conversion in the intermediate hurdles race; and development of the ability to use alternate legs in the intermediate hurdles in an emergency.

Distance running. The primary safety feature in training for distance running requires that the coach recommend physical activity with muscle groups other than the fatigued group. There must also be training variations to avoid boredom. It is desirable to develop a sane training regimen which will stabilize the aerobic capacity of the distance runner. Long distance runners usually develop aerobic capacity to a maximal limit through sustained training. Quality work increase would tend to enhance a safe stabilization.

Safety in training for distance running demands:

- discipline which permits and encourages vigorous practice
- development of a good balance between natural speed and endurance
- that the athlete progress through several years of hard work
- that the athlete develop the physiological and psychological capacity to endure pain and fatigue

Javelin. The leader must develop a program of training for strength and flexibility to avoid injury to knees, groin, trunk, sides, lower back, and shoulders. Safety considerations are significant because throwing the javelin is an unnatural movement due to the separation of the hip and shoulder axis and the delayed arm thrust for delivery with elbow ahead of the delivery hand.

Psychological and Physiological Considerations

Safety in track and field is significantly influenced by the psychological and physiological dimensions of training. These factors are most clearly manifested in five areas:

- the running program during the summer months
- the nature and extent of any weight-training program
- the nature and extent of any off-season competition in other sports
- the nature and extent of any injuries that may have been sustained during the summer, or which may have lingered from the previous season
- the event or events for which the athlete will train

The athlete must have a complete understanding of the facts concerning proper care of the body. It is important to use an objective approach to health facts for the well-conditioned body, rather than a long list of training rules which are almost impossible to implement. While there are some fundamental health facts which have a definite influence on the performance of an athlete, most of the "training rule" lists include items which are basically psychological. To break one of the published rules often would have little effect upon the performance of the athlete, but it may have serious social and emotional implications. Goals for the athlete should be high and he/she should be dedicated to the Spartan simplicities.

Psychological Considerations

The athlete is not only the sum of his/her physical qualities but also an intricate combination of psychological conditions. However great his/her speed or strength, these may be rendered useless if there is not an effective combining of the physical and psychological qualities at the most appropriate moment. One of the fundamental principles is that psychological conditions change and have varying effects upon the track and field performer.

"Psyching" is a term frequently used by athletes. It refers both to the performer's influence on the opponent and the ability to prepare for competition. Psyching takes many forms. It varies from simply ignoring an opponent and exuding confidence in the preliminary warm-up to dropping hints which start an opponent thinking negatively and running for second. A great performance has tremendous psyching influence. Psychological effects vary according to strength and length, and they are difficult to explain or predict.

An important point for the athlete to understand is that psychological states may be useful or undesirable. Useful states include interest, readiness, self-confidence, enthusiasm, and perseverance. Practice sessions should be organized to keep interest and enthusiasm high. A shorter practice session in which motivation and concentration levels are high is much more effective than a longer, loosely organized, and boring session.

The ability to sustain an intense workload is diminished if the athlete has lost the zest for practice. Too frequently, this condition is brought on by an hour workout extended to three hours. Should it be necessary to work over an extended period, vary the program, change the work pace — add a little "spice."

Physiological Considerations

The athlete's training in track and field is largely a self-determined responsibility. While the coach may direct practice routine, the athlete is responsible for diet, sleep, and rest.

There are a wide variety of training patterns that the athlete can choose to achieve a physiological base. An understanding of the effects of activity on the human body is absolutely essential in planning the individual workout. Athletes respond differently to weight training or other systems. Select the plan which is best for the individual. Slavish imitation may prove detrimental. Following are some general principles for training.

1. Perform exercises correctly in terms of the results desired. If an exercise cannot be performed correctly for the desired repetitions (usually a minimum of eight), reduce the amount of weight.
2. Increase repetitions each workout until 10 to 12 can be performed. Five to ten pounds should be added to the load when repetitions can be easily handled and performed with less than full effort.
3. Rest two to three minutes between exercises.
4. Schedule weight training workouts with three factors in mind:
   - alternate days for more effective workouts
   - space exercises during the workout
   - train but do not strain
5. Perform the exercises in a proper sequence. Shift the demands on muscle groups during workouts. This is accomplished by changing emphasis. Exercise the legs and the back, then the chest and arms. The workouts may vary from 30 minutes to two hours, given proper organization.
6. Muscular strength and endurance increase when exercises are repeated against increased resistance. Remember the following principles:
   - Progressively increase the total load.
   - Progressively increase the total time given to a load.
   - Progressively increase the repetitions against a constant and known resistance.
   - Progressively increase the speed of the performance.
   - Increasing the body weight without an increase in strength is bad. Always continue strength-building exercises in combination with weight control measures.
   - Exercising before proper warm-up has been completed is risky.
   - Continuing intense weight-training immediately prior to competition is not desirable. Allow muscle fibers to recover from soreness.

Every athlete may not have access to a training center. They can, however, improvise their own bar weights to use at home in the basement or back yard. Use of free weights can be of great value in developing the body.

Safety in track and field demands attention to individual events and to the sport as a whole. A safe program depends on the knowledge and experience of the teacher/coach. By following the guidelines set forth here, he or she can work toward providing the safest possible environment for students.

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Volleyball

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Volleyball is an activity that is relatively safe when played by people of all ages and at any level of ability as long as the participants in any group are fairly homogeneous. For this reason, it is a popular activity for backyard barbecues, picnics, parties, and any occasion when people get together to socialize and have a good time. The main reason why this activity tends to be safe is that it is truly a noncontact sport. The two opposing teams are separated by the net and thus there is usually little or no body contact between opponents. If, however, the game is played by two highly competitive teams, there can be contact above and below the net between spikers and blockers.

During games played by less skilled players, the danger of injury is greater because players lack effective body control and often fall into the net and over the center line into their opponent's side of the court. During games played on a less formal basis, there is often more of a disregard for the net rules which increases the possibility of injury or accidents. Because players are confined to a small area and the game demands constant jumping and movement on the court, it is not surprising that an occasional injury does occur when one player runs into or falls on top of another. These injuries are usually minor.

According to the 1990–91 NCAA Injury Study conducted at a sample of institutions the three body parts which are most susceptible to injuries are the ankles, knees, and shoulders. The top three types of injuries were strains, sprains, and tendinitis. The highest number of injuries occurred without contact with another player but contact with another player was second in cause of injury. These statistics are taken on players with a high level of skill. It has

been my experience as a coach that at the beginning levels of play the fingers are also frequently injured.

It is extremely important to the safety and success of the game that the players maintain a high level of communication on the court. Every time players know that they are going to play the ball it is essential that they call for it to notify their teammates of their intention. Good communication can eliminate many of the more common errors which are caused by collisions and can, therefore, reduce the potential for injury.

When discussing volleyball safety, four major areas need to be addressed: the teaching of proper technique for the performance of the skill; the selection of proper teaching strategies; the proper set up and use of correct and adequate equipment; and the use of proper clothing and protective equipment by the players. Players using improper technique are often injured because the repeated use of a body part in an inefficient position can cause muscle pulls, strains, or sprains. Teachers must be able to select the correct teaching strategy for the level and strength of the students. A teacher who hits a ball at a student who is incapable of receiving it at the given intensity puts that student in a dangerous situation. The equipment must be up to standard and safely set up. Perfectly good equipment can become dangerous if it is improperly installed. Finally, students need to prepare themselves for a game by making sure that they are not wearing anything that will be a hazard on the court, and by wearing any and all protective equipment which is advised.

Supervision

When teaching volleyball, several things should be considered in order to make the class as safe as possible. The ideal situation would be one in which there is at least one volleyball available for every student in the class and at least one court for every 12 to 15 students. Students will learn more quickly if they have the opportunity to handle the ball as often as possible. Unfortunately, however, the ideal situation is rarely found in the everyday teaching environment. When faced with a group of students working in a small enclosed area, there must be some control over how and where the students move. The following is a list of suggestions for making the class fun and safe.

1. In the initial class sessions when basic ball handling is being learned, do not set up the nets. They are not needed and could be an obstruction to free movement.
2. When running drills involving two or more players, make sure that all groups are moving parallel to each other and far enough from each other that there is little or no danger of collision.

3. The teacher must be in a position in the gymnasium whereby all students are within view and must be aware of any extraneous activity which could cause an accident.
4. When the teacher uses a piece of equipment as an instructional aid it must be used so that it is not a hazard to the students. An example of this is the use of a chair or box for the teacher to stand on when spiking the ball to the students. It must be far enough away from the net so that there is no danger that the blockers will come down on the chair and suffer an injury.
5. In teacher-led drills, the goal is to extend the students toward their potential. At the same time, however, it is essential that the teacher know the capabilities for each student so that none are forced to work at a level which is beyond their physical capacity.
6. When the activity of the day is volleyball that is the only activity which should be allowed. If the balls are available at the beginning of class for students to use in warming up, they should not be allowed to shoot at the basketball hoop or play variations of bombardment.
7. No student with an injury should be allowed to participate. This is particularly true of finger and ankle injuries.
8. Students should not be allowed to begin their warm-up unless the teacher is present in the gymnasium.
9. At the end of class all the volleyballs should be collected and put away until the teacher is ready to begin the next class.
10. Students should practice their drills on the court so that they gain an appreciation of the size of the playing area. Developing an awareness of the players around them helps students build the ability to react appropriately in a game setting.
11. When running drills which involve spikers and blockers, it is essential that the teacher make the students aware of the danger of balls rolling under the feet of the jumping players. Players who are serving in the role of retrievers for a drill should be told where to return the balls and how to get them there. Players should also be taught to react to a given signal during drills in case the ball does roll under or toward the feet of jumping players. A simple "NO" spoken with an authoritative voice should be warning enough so that players do not jump until the area is safe.
12. When more than one adjoining court is being used at the same time, it is essential that a rule be established which prohibits players from entering an adjoining court to play the ball. As soon as the ball enters an adjoining court it should be whistled dead by the official or teacher.
13. If there is another class or other students in the gymnasium they must also be made aware of the danger of rolling balls toward players who are participating in a drill, especially a drill using jumping activities. Often

unknowing students who are trying to be helpful can cause a dangerous situation.

Selection and Conduct of the Activity

Many injuries occur in volleyball because the student attempts to perform a skill without the proper technique. Students must be taught the proper beginning position and method of execution of each of the basic skills in volleyball. It is also extremely important that the teacher use the proper terminology in the teaching of skills. Often a student uses the incorrect technique because they have misunderstood or misinterpreted the teacher's explanation. A good example of this is the expression, "hit the ball with the finger tips," used when teaching the overhead pass in volleyball. In this skill the ball is contacted with the upper two joints of the fingers and not the finger tips If players attempt to hit the ball with the finger tips they are likely to jam their fingers.

Following is a list of considerations for teaching the basic skills of volleyball. Understanding and implementing them will help to ensure that the students learn proper technique and therefore play a safe game.

1. Make sure the correct terminology is used so that students thoroughly understand what is expected of them.
2. Teach the students the skills they need to gain good body control. This is particularly important in these three areas:
   - Teaching spikers how to transfer forward momentum into upward momentum. The planting of the heels before takeoff is essential.
   - Teaching blockers how to move to join a teammate for a double block without knocking the player over. It is the middle blocker's responsibility to watch and move to the outside blocker and not the ball. The outside blocker sets the block.
   - In defensive techniques in which the player hits the floor to save a ball, the player must be skilled in the proper method of falling. It is important that when falling the player learns to land on the body parts that have sufficient muscular padding and not on parts that are bony such as the knees, elbows, or hips.
3. When teaching the block or spike, make sure that students learn to land on both feet simultaneously. Landing on only one foot puts extra strain on that foot. If the player comes down on one foot and lands on a teammate's or opponent's foot, it is very likely that a serious sprain will result. Advanced skills often dictate that players jump to spike off one foot or land after a block on one foot but this is not recommended for beginners.

4. When teaching the spike in volleyball, make sure that the students hit the ball with a fully extended arm. Hitting the ball with a bent arm makes the player depend heavily on the rotator cuff muscles for attaining power. This added strain on the rotator cuff can cause tendinitis. On the other hand, when hitting with an extended arm you use the powerful muscles of the shoulder and back (Johns, 1977).
5. When teaching the dive or sprawl, make sure the players flex their knees and arch their backs. Failure to do these things causes the player to jam the toes into the floor causing bruised joints, especially of the big toe (Johns, 1977).
6. Make sure students condition their ankles.
7. If a student has weak ankles, they should be taped before each class and competition. Some coaches at advanced levels of play require all players to wear lace type ankle braces regardless of whether or not there has been a previous history of ankle injuries.

Environmental Conditions

The equipment used in volleyball is relatively simple. It consists of a net, standards for holding up the net, and volleyballs. When in competition the net also has to be equipped with antennae. These should be attached to the net near the sideline, the exact location depending on the set of rules governing the competition. During competitive volleyball it is also essential to have an official's stand. The United States Volleyball Association, the National Association for Girls and Women in Sport, and the National Federation of State High School Associations all publish rules and each set includes specific regulations pertaining to the safety of participants.

Following is a list of considerations for the teacher when setting up the gymnasium either for a class or for a competition:

1. The best standards are usually fairly heavy and must be handled with care when setting them up. Some standards include a base and will stand on their own before they are firmly attached to the floor as long as there is no tension placed on the net. If a slight tension is placed on the net, however, the standards will fall over very easily. When the teacher uses student assistants to set up, they must be aware of this danger. It is possible for a standard to fall over and hit a student and the resultant injury could be very serious. Teachers should make sure that the standards are held upright by someone until they are attached to the floor. This will eliminate the chance of an accident.
2. The standards must be placed at least three feet from the sideline.

3. Round standards are less hazardous to the players than any other type. Under both the National Association for Girls and Women in Sport rules and the National Federation of State High School Associations rules the standards and tensioning devices must be padded to a minimum height of 5' 6" with 1" thick, resilient, shock-absorbing material.
4. Standards which fit into a sleeve in the floor are safer than those with a base which requires guide wires. Support wires are very dangerous to a player who is moving to play a ball and is unaware of their location. If guide wires must be used, the heavy chain type are better than the wire cable type because they are not as likely to cause open cuts. Any type used must be covered with a soft flexible material. The National Federation of State High School Associations and the National Association for Girls and Women in Sport require that this material be at least ½" thick and that it must be applied to a height of 5' 6" (True, 1990–91; NAGWS, 1993).
5. The referee's stand should be covered by soft, flexible material in the same manner as the standards (True, 1990–91; NAGWS, 1993).
6. The cranks which are used to place tension on the net should be removable if at all possible. If they are not, the type which fold back so that they are not sticking out would be the next best. If neither of these types is available, the tensioning mechanism must be completely covered with soft flexible material (Smith, 1991).
7. The antennae must be securely fastened to the net. Each antenna has a device to attach it to the net. Once attached, a piece of white athletic tape should be wrapped around the attachment for added security and also to protect the players from being injured by an antenna. If during a competition an antenna becomes dislodged, the competition should be halted immediately until it can be reattached. A loose antenna could cause a serious eye injury.
8. The wire cable which extends through the net should have a plastic covering on it. This prevents the wire from splintering and causing injury when anyone touches it as they try to set up the net or during play. The cable at the bottom of the net should be rope as rope is less likely to cause injury to a player who accidently runs into it.
9. Due to the high degree of tension placed on the nets to get the correct height, a great deal of stress is also placed on the floor plates used with standards that have a base. Often when these standards are improperly attached, or if guide wires are not used when they are needed, the floor plates begin to raise up from the floor. These plates can become a hazard to unsuspecting athletes when the standards are not in place.
10. If wire supports are used for the standards, it is recommended that in addition to covering them strips of material be hung from the wire to alert

players of their presence (Smith, 1991).

11. A clear area should surround the court. The United States Volleyball Association recommends that this clear space be at least three meters for an outdoor court and at least two meters for an indoor court (Smith, 1991).
12. The surface of the court must be smooth and should not be abrasive in any way.
13. If an outdoor court becomes soft or slippery, the game should be stopped immediately (Smith, 1991).
14. Any off-court areas where hazards exist should be declared nonplayable. Players should not be allowed to enter nonplayable areas for the purpose of playing the ball. Players should be made aware of this and during play the ball should be whistled dead as soon as it goes into such an area.
15. For beginners, the air pressure in the ball should be kept at the lower end of the acceptable range. Unfortunately, most teachers have a tendency to make the ball pressure too high which causes the ball to hurt the student's forearms and even cause some bruising.
16. During competition the floor often gets wet after a player falls while making a good defensive effort. It is essential that the competition be halted until the floor can be toweled dry. The wet surface is extremely slippery and very dangerous.

Certain items worn by players can help protect them from injury. There are also several items which can be a hazard to the wearer or to other participants in the game. Following are suggestions for a player's personal equipment that help to prevent injury.

1. Long-sleeved shirts help to protect the arms and elbows from floor burns, particularly when the player is forced to the floor during a defensive maneuver (Johns, 1977).
2. Knee pads are highly recommended at all levels of play. They protect the knees from floor burns and bruises. Many players are not as inhibited about hitting the floor when they wear knee pads and thus have better defensive skills. Some coaches believe that knee pads often cause players to go to the floor too soon or when it is not really required by the situation, and therefore if players do not wear knee pads they will learn to be quicker on their feet. At beginning levels of play it is recommended that knee pads be worn. At higher levels of play the players are better able to decide for themselves whether or not to wear the knee pads.
3. All three sets of rules prohibit the use of jewelry and certain other articles during play. Generally rings, bracelets (including those of string), earrings, and necklaces must be removed. Religious medallions and medical identifications may be worn if they are removed from the chains and taped or sewn under the uniform. Hair barrettes are permitted as a means of secur-

ing the hair. Braided hair with beads must be secured so that it will not present a safety hazard to the player, teammates, or opponents (NAGWS, 1993).

4. The wearing of a hard cast is not allowed on any part of the body. Hard splints or other protective devices are not allowed to be worn on any body part waist high or above. Soft bandages of any type are allowed (Smith, 1991).
5. Protective type braces for the lower extremities are allowed as long as there are no exposed metal parts that may be a hazard to other players (Smith, 1991).
6. Prosthetic limbs may be worn under certain conditions. They may have to be approved by the governing body of the rules being used. It would be wise to check in advance and get the approval in writing so that there will be no problem with the officials on the day of a competition. These devices should be covered with padding and should not endanger the other participants in any way.
7. Anything worn on the head should be soft and pliable. Hats are not allowed but sweat bands and bandannas used as sweat bands are all allowed as long as they are being used to secure the hair and not just for adornment (Smith, 1991; True, 1991–92; NAGWS, 1993).
8. All players should wear appropriate footwear.
9. Eyeglasses should have unbreakable lenses and should be firmly attached to the head. Contact lenses would be safer for both the wearer and the other players.
10. It is strongly recommended that gum chewing not be allowed during participation.
11. Wearing ankle braces is an effective means of preventing ankle injuries (Kostos, 1990). Players with a history of ankle problems should consider this option. Some coaches require all of their players to wear braces regardless of their previous histories.

Although the sport of volleyball is not inherently dangerous, if proper safety guidelines are not followed accidents can occur more frequently and with greater severity. Time taken in advance to ensure the safety of the participants is time well spent. As in most sports, however, accidents can occur which may result in injury. When players are moving quickly in a limited amount of space this cannot be avoided completely. The goal should be to make the class, practice, or game as safe as possible.

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25

Wrestling

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Wrestling is an exciting activity for students of all ages. Facilities and equipment are much improved compared to past years and interscholastic wrestling is ranked among the top five sports in numbers of participants and teams. However, considering the dual combative nature of the activity, it is obvious that safety factors must be a high priority with physical education teachers.

In some parts of the country, elementary school students are familiar with wrestling. Many of them have seen interscholastic matches and some have older brothers who are on wrestling teams. Unfortunately, however, the only kind of wrestling that many other elementary school students have seen is the fake "rassling" seen on television. It is very important, therefore, that students be informed never to use techniques that would endanger their opponent's life or limb.

To present a high quality wrestling instructional program, it is advisable to start dual combative activities at the third grade level. By this time, the students have experienced self-testing activities and are psychologically ready to test themselves against others. If safety measures are stated emphatically by the teacher, the students will be aware of and establish patterns of behavior which will show concern for the safety of others. It is not uncommon for some students who have not experienced simple dual combatives at eight or nine years of age to be apprehensive about participating in actual wrestling when they are older. Simple combative activities, therefore, such as chicken fighting, foot push, hand wrestling, hop and pull, chest wrestling, and arm lock wrestling will provide for the needs and interests of students. This type

of activity will also help students develop the balance necessary for actual wrestling.

The teacher should refer to the current official high school wrestling rules (published by the National Federation of State High School Associations) for illegal holds and illustrations of these holds. The NFSHSA rule book also includes potentially dangerous holds. Some techniques and holds, although legal, may be dangerous if not executed properly. The instructor must guide the student in the defensive position as well as the person performing the technique. Some positions are uncomfortable and may be frightening to a beginning wrestling student. The front cradle hold is an example of this situation. Some students may feel they will have trouble breathing when held in this position and their opponent's body weight is on them. The teacher should be aware of this, and help the students understand the holds and their reactions to them.

The most potentially serious injury in any activity involves the spinal cord. The physical education teacher presenting a wrestling unit must be aware of those techniques, holds, and body positions that have the potential for injury to the spinal cord. The teacher must present wrestling techniques and activities with special emphasis on this safety aspect, especially with regard to the area of the cervical vertebrae. The teacher should instruct the students to stop any wrestling activity whenever a student's head is in a vulnerable position or injury to the spinal cord may result. Signals should be developed whereby the teacher or an opponent can signal for an immediate release of a potentially dangerous hold. The teacher should introduce all dual combative lead-up activities and actual wrestling lessons with the following neck strengthening activities:

- neck bridging
- resisting half Nelson
- resisting quarter Nelson
- resisting three-quarter Nelson
- combination sit-up and neck resistance exercise

To further emphasize safety measures and also encourage the problem-solving method of learning, the teacher should have the students experience isolated "tasks" or "situation wrestling." Situation wrestling is defined as a trial in which one student will attempt an offensive technique and the other a defensive technique. Examples include the turnover, breakdown, and go-behind.

When the teacher "shows and tells" technique, safety factors should be thoroughly explained. To help with safety measures as well as accelerate the learning process, the teacher should have at least one assistant. The assistant may be a co-teacher, student teacher from a local college, or a skilled senior

student. Instructional emphasis should be on precise techniques and drills to perfect techniques. Under no circumstances should the teacher's methods emphasize brute strength and aggressiveness. There is no place for a "macho" attitude in the instructional program.

Progressions must be considered by a teacher when presenting wrestling instruction. When young people learn to walk they experience falling, and learn how to fall and adjust to falling without injury. However, since falling techniques are rarely used after early childhood, students must re-learn falling skills. Under no circumstances should a person fall with the fingers pointing backward. This position locks the elbow joint and a dislocation may occur. Falling to the mat safely should be part of every lesson's warm-up period.

The teacher should not start the wrestling unit with takedowns, even though the official match starts with the wrestlers in a neutral standing position. For the purpose of safety, takedowns and counters for takedowns should be taught last, after basic techniques and falling skills have been well learned and practiced. When teaching "takedown throw" techniques, especially those involving high amplitude, dummies should be used initially. "Live" throws should only be permitted on an individual permission basis, after the technique has been perfected using a wrestling dummy

The teaching order should be as follows:

1. Falling techniques.
2. Getting out of pinning combinations.
3. Reversing from the defensive position.
4. Breaking the opponent down from a position on hands and knees.
5. Applying pinning techniques.
6. Escaping from the defensive position.
7. Takedowns from neutral position on the knees or at least one knee down.
8. Takedowns from standing.
9. Counters for takedowns.

Because of the complexity of wrestling skills and the potential for injury, it is essential that safety be of the utmost concern to all. Following are concepts that are essential to the safe conduct of a high-quality instructional wrestling program.

Instructor

1. Presents the important rules of wrestling and assists students in gaining an understanding of potentially dangerous positions and techniques which should be used with caution.

2. Gives beginning students lead-up activities which are appropriate to their ability levels and which relate to some aspects of wrestling.
3. Has interscholastic or collegiate wrestling experience.
4. Has an assistant or student teacher who was a high school or college wrestler.
5. Took a wrestling course in college.
6. Has a working knowledge of basic wrestling techniques and the ability to present them in logical progression.
7. Has an understanding of exercise techniques which will prepare students for wrestling.
8. Presents dual activities or combative games that will not only stimulate students' interest but help them develop balance and other qualities of motor movement necessary for wrestling.
9. Exhibits concern for cleanliness and safety.

Students

1. Suitable clothing is t-shirt, shorts, and warm-up pants. Loose fitting clothing should not be worn. Belts, buckles, zippers, snaps, etc. are not allowed.
2. Rings, watches, bracelets, necklaces, earrings, and other forms of jewelry may not be worn.
3. Fingernails must be trimmed beyond the ends of the fingers.
4. Clean socks should be worn. Shoes should be taken off and left around the edge of the mat. The soles of shoes carry bacteria, as well as dirt. Sneakers with heavy soles may also cause injury.
5. The students should be weighed and their actual weights recorded. Names and weights should be posted. Students should not be matched up with more than a 10 lb. difference in weight.
6. Students should be prohibited from wrestling when recovering from illnesses or injuries.
7. It is recommended that the teacher do skinfold tests on the students to determine their lean body weight. Skinfold calipers are inexpensive and the procedure is simple.
8. Students should be paired or partners selected based on weight, age, and physical development. Lean body weights are more important than actual weights.
9. Students must recognize their responsibility for their partners' safety as well as their own.

10. Students should be aware of other students' place on the mat as well as their own.
11. Students will be required to officiate matches and supervise classmates. They should be prepared to stop students physically using a "hands on" method and also catch them and command "stop" if they are in danger of going out of bounds.

Mats

1. The wrestling unit should be conducted on a plastic cellular foam mat at least one inch thick. Thicker mats provide more safety. Old packed-down hair and felt mats are not suitable in physical education classes. Tying these mats together and using a plastic cover is not an acceptable safety practice.
2. The mats should be washed daily with a concentrate that cleans, disinfects, and deodorizes. The product should also serve as a fungicide and virucide.
3. Sections of mats should be securely taped together. If the mats are put down daily, two inches of tape is satisfactory, providing that it is applied well. Three inches or four inches of tape is recommended if the mats are used for several days or weeks.
4. The temperature of mats should be between 60 and 70 degrees. A mat at 40 degrees is hard, rigid, and has a "boardy" surface. It will not absorb as much shock. A mat at 90 degrees is soft and has a greater tendency to "bottom out."
5. It is advisable to recondition foam mats every five years. If the vinyl coating peels off a mat, the exposed foam core has less ability to provide safety.
6. Foam mats should be turned over periodically so both sides receive equal use.
7. Each pair of students should have 100 square feet of mat space on which to practice. Specific areas can be marked off by tape temporarily or by permanent 10-foot painted circles. The typical 40' x 40' wrestling mat has nine 10' diameter circles on the practice side. The students should be instructed to confine their wrestling activity to the area inside the circle. Space between circles is a "buffer zone" for safety.
8. If the wrestling unit is taught in a room with walls close to the mats, the walls should be padded up to a minimum of five feet. Posts, radiators, and similar protrusions must be padded with mat material.

Safety Tips

The teacher should have knee pads, elbow pads, earguards, face masks, and mouthpieces in the equipment room and available for students.

An effective and safe teaching method for teachers is to assign three students to a group. One student will be assisting with instruction, leading technique drills, starting and stopping situations, and officiating matches. Obviously, a student cannot assume the responsibility of the teacher, but if properly instructed and supervised, he/she can make the learning environment considerably safer. The students will rotate roles from offense to defense to official. When preparing and writing lesson plans, the teacher should include statements that relate to safety measures. While accidents and injuries may occur, the teacher who emphasizes safety and makes the students aware of potentially dangerous situation will have fewer injuries and accidents as well as a more successful wrestling unit.

Many students will enjoy wrestling because of their interest and developmental need for this type of activity. The enjoyment the student receives will relate directly to the teacher's personality, knowledge, wrestling talent, class discipline, experience, and emphasis of safety factors.

Principles of Safety

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